



FRIDAY, JUNE 4, 1880.

## Contributions.

## The Reading Coal &amp; Iron Company.

PHILADELPHIA, June 1.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Crying over spilled milk is of quite as much avail as would be a serious debate after the accident whether it would have been better to carry the milk more carefully or not to have started with it in the first place. So it is hardly worth while now to argue, discuss the wisdom or unwisdom of the policy of the great coal carrying companies. They have all pursued the same general policy and only one of them has made any return to its stockholders for many a month. Nevertheless, as the suspension of the Philadelphia & Reading Railroad Company has been directly due to its investments in the Philadelphia & Reading Coal & Iron Company, it will be necessary to examine closely the progress of the companies toward insolvency in order that a way of retracing retreat may be sought.

It is entirely unnecessary to discuss the matter in a spirit at all inimical to President Gowen, whose honesty and integrity of purpose have never been doubted by any one, or questioned even by those to whom he was personally a stranger. President Gowen is a very able, brilliant and eloquent lawyer—a man probably without his superior in the state before a jury. He was not a railroad man in any sense of the word when he was elected President of the Philadelphia & Reading Railroad Company, with a contract that he should retain the office for a decade at a salary of \$30,000 per annum. He is a man of strong will, fixed purpose and great personal magnetism—the very man to whom a board of directors would prove only satellites to a central planet. He could blind their eyes to the real situation and lead them to look upon it with his eyes, and to adopt his views without analysis or investigation. Year after year they signed his reports that held out the glittering promise of prosperity that banished like a mirage in the desert, and they believed with him in the good time coming, as if compound interest never grew and the sieve might be filled if the pouring in continued long enough. Nor was President Gowen hardly less successful with his rivals. He could argue with them until they almost felt compelled to accept his conclusions, and it was only after the charm of his presence and his manner had been removed that their eyes were opened to the falsity of his premises and the errors in his calculations.

Only when the character of the man is in a measure understood is it possible to comprehend how the policy of expansion could have been permitted to go on unchecked for so long a time. Grant for a moment that the increased capital represented an addition to the property of an equivalent amount, and that the company was compelled in self-defence to enter into the purchase of coal lands. There was a reason to fear the encroachments of the Lehigh Valley, which had connection with the Middle Field, but the management was not content with self-protection. Much of the property acquired was necessary neither to the existence nor the prosperity of the company, much of it was entirely disconnected with the road and could not be made tributary to it without vast additional expenditure; much of it could have been better managed by individual capital, and much is scattered in other states of the Union, where it can never be brought into direct connection with the Reading system. Not only were mines bought that could have been reached by other lines, but wholesale purchases were made in the Schuylkill region, large tracts of land bought that not only were inaccessible to any other company without the building of thirty or forty miles of road, but which will not be worked at any time within the next quarter of a century. The Coal & Iron Company at the close of the last fiscal year owned 92,221 acres of coal lands, 68,592 acres of timber lands and portions of coal estate beyond the crops of the coal veins, and 5,959 acres of iron-ore lands. Upon these coal lands the company owned seventy-five collieries and about ten blast furnaces. The company not only carried the coal—all that it had any right to do under its charter—but by virtue of its other charter owned the lands, built the collieries, mined the coal, sent it to market, sold it or shipped it from their own wharves in their own steam vessels to their own wharves all over New England, where it was sold at retail by their own agents. They had even gone so far as to build an extensive ship-yard at their docks, with all the necessary shops for building ocean steamships. The company was the Bottom of the trade. It played all the parts and from the time that the pick was struck into the vein until the coal was placed in the cellar of the consumer the company had entire control of it. To attempt to monopolize all branches of trade feeding its road was to destroy all individual enterprise, which is such a valuable assistance to the traffic of a railroad. No corporation ever yet attempted it and succeeded.

It would perhaps be fair to call the period from 1876 to the present the era of losses, for the company never in any one of those years met its fixed charges. This was the inevitable result of a system of book-keeping thus explained by President Gowen: "The entire loss of the Coal & Iron Company, together with the interest upon the cost of the lands and the commissions and discounts upon the loans issued by the Coal & Iron Company to secure the money to

purchase them, has been charged to the capital account of coal lands upon the books of the Coal & Iron Company." This was very proper as a matter of book-keeping; but the Coal & Iron Company was insolvent from the beginning, save for the endorsement of the railroad company—an endorsement which compelled the treasury of the railroad company to meet every year not only the entire amount of interest due upon the bonds of the Coal & Iron Company, but a very handsome amount in addition to that to meet the actual loss in operating. Not only did the company fail to receive any return whatever for its investment of sixty millions in coal lands, but it had also to pay from half a million to a million a year for the purpose of taking care of that investment and trying to make it meet its expenses.

The business of the railroad company has varied not a little during the four years that have elapsed since it could show a surplus, but the income, both gross and net, has varied much less. Here is a statement of the business of the last four years:

	1876.	1877.	1878.	1879.
Passengers.....	10,936,157	6,674,889	6,376,413	7,908,648
Tons of coal.....	5,595,207	7,255,318	5,909,140	8,147,580
Tons of merchandise.....	2,493,277	2,837,648	2,757,839	4,177,976
Total.....	10,236,326	11,833,825	10,383,317	14,073,159

The last year was one of the best that the company ever knew, as far as the volume of traffic goes. The passenger movement was 16 per cent. greater than in any year except that of the Centennial Exhibition; the coal traffic was 11 per cent. greater than was ever known before; the movement of general merchandise was 20 per cent. heavier than in any year before, and the total tonnage was 30 per cent. greater than the maximum hitherto. And yet so low was the rate at which this vast business was done that the percentage of operating expenses rose from 63.4 per cent. in 1878 to 68.6. The net deficit of the railroad company alone was \$1,063,421 and the coal company fell \$1,097,764 short of paying its running expenses and the interest upon its debt.

In the following table I have put together for comparison the earnings in each year of the last four, together with the principal items of liability, so as to show at a glance the enormous increase in the debt and the interest burden without any proportionate gain in income:

	1876.	1877.	1878.	1879.
Travel.....	\$2,433,685	\$1,010,050	\$1,526,423	\$1,094,150
Merchandise.....	2,949,501	2,913,588	2,680,780	3,827,496
Coal.....	6,708,082	7,505,207	7,206,952	7,186,232
Mails.....	54,484	41,587	41,665	44,944
Miscellaneous.....	81,159	72,478	73,787	53,531
Gross earnings.....	\$12,227,511	\$12,142,910	\$11,539,593	\$13,106,353
Expenses.....	8,510,350	7,751,693	7,319,306	8,987,341
Net loss.....	\$3,717,161	\$4,391,217	\$4,220,227	\$4,119,011
Per cent. of expenses.....	69.6	63.8	63.4	68.6
Funded debt.....	71,183,300	75,943,324	77,144,542	77,924,701
Bills payable.....	6,417,319	5,501,969	5,284,173	7,550,079
Debits due.....	850,997	925,901	1,230,094	1,572,605
Interest paid.....	3,971,587	4,536,472	5,018,830	5,108,585
Net loss.....	1,355,788	163,450	832,047	1,063,421

The Coal & Iron Company was running behind at this rate:

	1876.	1877.	1878.	1879.
Net loss.....	\$935,359	\$755,478	\$752,040	\$699,450
Interest paid.....	989,579	1,020,378	1,088,086	1,054,085
Debits due.....	71,880	634,982	908,930	1,507,830
Bills due.....	20,597	148,943	233,703	247,474

To sum up, there has been a steady falling off in the net earnings since 1877, a rapid increase each year in debt of all kinds, and a steady increase in the net deficit coupled, of course, with a still more marked appreciation of the interest account. In short, the company which had paid out in the first six years of the decade fifteen millions more in dividends than were actually earned, in the last four fell more than ten millions short of meeting its fixed charges, to say nothing of dividends. Pertinent to this is the following comparison of the cost, receipts and profits per passenger and per ton both of coal and merchandise for the four years, the figures being fractions of a dollar:

	1876.			1877.			1878.			1879.		
	Cost.	Receipt.	Profit.	Cost.	Receipt.	Profit.	Cost.	Receipt.	Profit.	Cost.	Receipt.	Profit.
Passengers.....	0.119	0.323	0.134	0.122	0.241	0.119	0.132	0.252	0.119	0.132	0.252	0.119
Merchandise.....	0.563	1.183	0.620	0.449	1.027	0.578	0.475	1.034	0.559	0.475	1.034	0.559
Coal.....	0.612	1.199	0.587	0.475	1.034	0.559	0.475	1.034	0.559	0.475	1.034	0.559

It is plain from this showing that the railroad company can be depended upon to furnish four millions net earnings per annum. Why then has it been found impossible to make the Coal & Iron Company pay running expenses? In the first place, aside from its enormous load of interest accruing upon coal lands yet undeveloped and purchased at high prices, the company is one of the most expensively managed in the country—perhaps more so than any other. It cannot be otherwise when such an enormous property is left to salaried agents instead of the direct management of the capital most interested. The company makes a favorable showing of the cost of getting coal to the mouth of the breaker, the average being \$1.237 per ton for 1878 and \$1.148 for last year. And yet it has been compelled to admit a loss when other companies have shown a surplus. Last year the company sold 4,456,343 tons of coal for \$9,892,029—an average of \$2.22 a ton, or \$1.08 more than the cost of getting it out. But this was insufficient to meet the additional cost before the coal was sold; for freights, general expenses and taxes brought the expense up to almost eleven millions, or \$2.56 a ton, showing a net loss of 23.4 cents a ton, without allowing anything for royalties, which range from 20 to 40 cents a ton. The year before, the sales were 2,767,223 tons for \$7,795,203—an average of \$2.817 a ton. Although this was an average of sixty cents higher than the price ruling in 1879, the cost of the smaller production was so much greater, that the total loss of the com-

pany was \$808,568, or 29.1 cents a ton. During this year the Lehigh Coal & Navigation Company mined at its Summit mines, 431,239 tons of coal at an average cost, the year through, of \$1.546 a ton, which includes the lateral tolls of 10.6 cents a ton, so that the actual cost of getting out the Lehigh coal was only 20.3 cents a ton more than that of the Schuylkill coal. And yet such was the difference in the marketing of the two coals that the Lehigh Company earned \$114,757 net after paying all mining charges and taxes chargeable to coal lands. This is an average of 26.6 cents profit compared with a loss of 29.1 on the Schuylkill coal, showing that the Lehigh coal netted the producing company 55.7 cents a ton more than the Schuylkill coal. Such a result upon the Schuylkill coal would have turned the Coal & Iron Company's deficit of three-quarters of a million to a profit of an equal amount. The Susquehanna Coal Company, one of the coal companies controlled by the Pennsylvania Railroad, also makes a detailed report. In this respect it stands alone, and I think these two reports to which I have referred in this connection are the only sources of information available from which to ascertain the actual cost of coal-mining. This company has a most rigid system of accounts, its construction account being definitely closed and all new work, repairs of every kind and additions to equipment being charged to operating expenses. And yet, in spite of such a system of book-keeping, the Susquehanna Coal Company reported a profit last year of 22.9 cents a ton, paid all expenses and interest on its bonds with a trifling deficit of less than \$10,000, which will not half represent the actual cash additions to property. With its present load of debt the Coal & Iron Company could not meet its interest without receiving \$3.44 a ton for coal at Schuylkill Haven, which is about 75 cents higher than the present circular rates.

This directs us inevitably to the solution which has been practically determined upon by at least one of the Receivers, and perhaps two—the sale of the unproductive coal lands, or rather the handing them over to the mortgagees. This will be done gradually, but the step will not be long delayed.

R. W. M.

## AMERICAN SOCIETY OF CIVIL ENGINEERS.

## Report of the Twelfth Annual Convention.

Members of this Society assembled in the hall of Washington University, in St. Louis, on Tuesday, May 25, to hold the twelfth annual convention. Over a hundred members were present. The Secretary explained that President Fink was unable to be present because he is on the eve of departing for Europe. Vice-President Chanute was unable to be present, owing to an accident by which he has been temporarily disabled. It was the custom, the Secretary explained, to choose a President and Vice-President of the annual convention from the local members of the Society in the place where the convention was held. He therefore called on Mr. James B. Francis, of Lowell, to preside temporarily. Captain J. Eads was then nominated and elected, President of the Convention. Mr. Francis said it was hardly necessary to introduce Captain Eads. On being presented as President of the Convention there was a pleasant demonstration of applause, after which Captain Eads said:

"Gentlemen of the Convention: I feel grateful for this evidence of your regard. To be called upon to preside over the deliberations of the Society of Civil Engineers, numbering as it does among its members many of the most eminent engineers in the world, whose originality of conception, boldness of design and high scientific attainments have added so much lustre to the profession at home and abroad, should certainly fill the ambition of every member of the Society. I therefore repeat to you that I feel deeply sensible of the high honor which you have conferred upon me. As the profession of a civil engineer does not involve a knowledge of parliamentary rules, I shall have to ask your forbearance if I commit any error in that particular, and as engineers are not expected to be orators, I shall proceed at once to the order of business. We have an orator present who will address the convention, the Hon. Mayor Henry Overstolz, of St. Louis. On being introduced the Mayor spoke as follows:

ADDRESS BY MAYOR OVERSTOLZ.

"Mr. President and Gentlemen of the Convention: The government and people of the city of St. Louis most cordially welcome you on this occasion, and gladly extend to you the freedom and hospitality of the city. This is, I believe, the twelfth annual convention of the American Society of Civil Engineers, and while we trust that its results may be equal in harmony and importance with any of the former meetings, we further hope that you may carry away from St. Louis some adequate impression of its commercial wealth and influence, and of the warm sympathetic interest with which all of our people regard the objects and spirit of your society."

"Gentlemen, you meet to-day in the great inland city of the continent, one whose history and development, and that of the magnificent regions surrounding it, constitute one of the most marvelous chapters in the record of American civilization. Within the space of almost half a century a mighty people and a metropolis, the commercial influence of which is felt throughout the globe, have been created. The time is not yet beyond the memory of living men when St. Louis was but a river village, and the valley of the Mississippi was almost in a state of nature. This swift transformation scene, this 'miracle-play' of history, is full of solemn significance and beauty, but chiefly does it illustrate the irresistible power of human energy when guided by the improved instruments and principles of modern knowledge."

"I allude to these things, gentlemen, not from any spirit of enthusiasm for the city of my home, but because there are facts connected with the rapid advance of St. Louis that have educated our people to appreciate properly and to respect profoundly the glorious profession of which this convention is at once the exponent and representative. The natural advantages of location, the settlement and cultivation of the vast agricultural lands stretching out on all sides of us, might ultimately have made St. Louis an important city, but only by a slow process stretching through many ages. In the olden time, in the gray and flickering dawn of civilization, cities and their commercial influence were slow of growth, and progress could only be accelerated by making them the seat of imperial power. It is only in modern times that it became possible to compress civic growth within the limits of a century or less."

"This possibility is almost wholly the product and fruit of the science of civil engineering, and to this science the rapid progress of St. Louis must be largely attributed. It was the



steamboat that first stimulated into activity the sluggish life of the river trading-post; it was the railroad that broke down the barriers of distance, and, pouring in population and wealth, started our foundries and factories, and carried the products of our industries to the shores of the Eastern and Western oceans; and it was the telegraph that made the daily diffusion of our commercial data possible, and so rendered possible the establishment of a controlling Western market here. Improvements in machinery stimulated all branches of manufacture; the building of our magnificent bridge made a railroad highway across the Mississippi and gave us indispensable commercial facilities; and lastly the jetties have brushed away the obstructions at the mouth of the Mississippi and made a broad and deep highway to the ocean for the ships that carry our cereals to all quarters of the world.

"These things, these great achievements, are the work of civil engineering and of sciences connected therewith. It is the men of this profession that practically apply science to the forwarding of human industry, and this profession has undoubtedly accomplished more for the material advancement of this country than any other I know of.

"The facts alluded to have taught the citizens of St. Louis the benefits flowing from this profession. They realize all it has done for the city in its trade, manufactures, water-works and general improvements. Hence it is evident, gentlemen, you are among friends and admirers, and this feeling should assist the enjoyment of your visit.

"The President of our Board of Improvement and the Chief Engineer of our water-works are, I believe, members of your Society; also our distinguished citizen, James B. Eads, whose bold and original genius has done so much for this city in the great steel arch bridge over our river, and for the country generally in the successful execution of the jetties. To a former member of your society, the late Mr. Kirkwood, this city is indebted for the original design of our water-works system.

"In a city that owes so much to civil engineers, there must be many objects worthy the attention and inspection of the members of this convention. The bridge, the water-works, the iron furnaces and many other features of interest, will, I think, prove worthy of a visit. I trust you will also have time to see our parks and public institutions, and so far as possible, I will gladly co-operate in any arrangements for your entertainment.

"In welcoming this convention I express the sentiments of all our people, and I beg to assure you that your proceedings will be regarded with the deepest interest and respect by all classes."

After thanking the Mayor and transacting some routine business, the next business in order was the reading of papers.

#### THE HUDSON RIVER TUNNEL.

Mr. Chas. B. Brush, of New York, read an address on the "Hudson River Tunnel," now being constructed between New York and Jersey City by the direct application of compressed air in accordance with the Haskin system of tunneling in soft material. Large engravings were distributed among the audience showing the various processes used in the work. The address gave full details of the method of construction. The material through which the tunnel was being carried was a tenacious silt weighing about 100 lbs. to the cubic foot, very tough under compression, but becoming semi-fluid on free application of water. Ventilation was provided by constantly forcing pure air into the tunnel and the foul air out with the silt, which passed away through a "blow-out." About 82,000 cubic feet of air was daily forced into the tunnel under a pressure of 18 lbs. to the square inch. The air was washed or purified twice before entering. The pressure was sufficient to give the needed support to the interior arches of timbers and plates used in construction. The work was carried on night and day by three shifts of men working eight hours. The men went out into the open air once in four hours.

There will be two single-track tunnels under the Hudson River, each about 18 ft. high and 16 ft. wide in the clear. The approaches in New York and Jersey City will be a large double-track tunnel. The length of the tunnels under the river will be about 5,500 ft., and the land approaches each about 3,000 ft. Soundings have been carefully taken across the river, and the material through which the tunnel is to be driven has been found to be a tenacious silt, which is admirably adapted for this work. A shaft has been sunk on the New Jersey shore near the river line, and the tunnel has been started from the side of this shaft under the river, so as to keep at least 20 ft. of silt-covering over the tunnel at all times.

The two-tunnel system under the river has been adopted because it actually requires less excavation and brick work to construct these two single tunnels than it would one large tunnel of sufficient capacity; besides the enormous advantage of always working a comparatively small heading of 346 square ft. as required in smaller tunnels, over that of 754 square ft. which would be required in the large tunnel.

Work was commenced in Nov., 1874, but was soon stopped by litigation, which continued until Sept., 1879. Since that time the work has been steadily progressing. The shaft was sunk by first building a wooden "shoe" and building masonry on top of this shoe as it sank in consequence of the weight, put upon it; the material inside of the shaft being excavated as the shoe sank into the soil; the settlement of the shaft amounted to about one foot per day. Nov. 3, 1879, the shoe was finally in position, and the concrete work in the bottom immediately commenced. This was completed in about thirty-six hours. The average thickness of the concrete was 2 ft. 9 in. An air-lock of 5 in. wrought iron, with half-inch heads, and doors 3 ft. wide and 4 ft. high, was then placed in position about half way down the shaft. Air pressure was then put on, and the material excavated sufficiently to build an iron ring 6 ft. 4 in. in diameter and 8 ft. in length. As soon as this was successfully accomplished, a series of rings were built, united at the top, but increasing about 18 in. in diameter for each succeeding ring, thus forming steps descending to the grade of the final tunnel. This temporary work was then lined with concrete, and on Feb. 9, 1880, the first plate was put in position on the most northerly of the permanent tunnels under the river. Since that time, the work has been gradually systematized, and it has gone on rapidly and smoothly. During the first week the advance was hardly one foot per day, but at present the rate is four feet in each twenty-four hours.

The rings in the permanent tunnel are composed of wrought iron 3/4 in. thick, and 2 ft. 6 in. wide. There are 14 plates in each ring; 6 top plates, being three feet in length and weighing about 170 lbs. each, and the remaining plates 6 ft. in length and weighing about 320 lbs. each. These weights include the 3-in. angle iron that is riveted to the sides and ends of each plate and the 1/2 in. bolts that bind the plates together. The bricks are hard burned of the best quality, laid in the best Rosendale cement.

The heading has advanced as follows: The face of the heading is always the exposed silt, which is so stiff when under air-pressure that it can be cut in benches as a series of garden terraces, and also into steps rising from one terrace to the other. An average slope of about 45 degrees is usually left on this face, and the excavation for the building of the ring always commences at the top of the tunnel. Usually five

rings are built at the same time; each one of the five rings toward the rear being more nearly completed than the ring directly in front of it. The first four plates in each ring require some slight support, but when the work on the rings has been further advanced the plates are easily held in position by air pressure, the bolting to the adjoining plates and the support received from resting the plates directly on the bed of the silt. The bracing and timber ordinarily used in tunneling are not required on this work.

#### DISCUSSION.

On the conclusion of the address, several of the members questioned Mr. Brush as to the nature of the silt through which this work was being carried on.

Mr. Welsh said he had found this difference in that vicinity between clay and silt. He had found gravel to sink as much as 70 ft. through silt, whereas on clay it would not sink at all.

Mr. Brush said his experience had been a little different in that particular material. A layer of gravel would sink, but the silt would soon compress and the gravel would not go through it.

Mr. Welsh said that would be the case where the layer was evenly laid and on a broad surface; but a narrow ridge, he thought, would sink, or if one side was heavier than the other it would sink unevenly.

Mr. Chesbrough said he knew that work of this kind could be carried on through very soft clay if constant vigilance was exercised, but he had watched the progress of this work with a great deal of interest to see how the pneumatic process would operate in silt.

Mr. Brush said at the depth of the tunnel the silt was of a hard slated nature and no difficulty was experienced.

#### PERUVIAN TUNNELS.

A paper on the Chisbote tunnel in Peru, by O. F. Nichols, was next read by Mr. Croes. The paper was a description of the process employed in running a tunnel for the Chisbote & Huarez narrow-gauge railroad. The work was designed to open to commerce and relieve a large and fertile district in the upper valley of the Santa River. The valley lay at an elevation of from six to twelve thousand feet above the sea level. In spite of the fact that it was practically isolated from the outer world, six large towns had grown up in it, and the aggregate population was 70,000 people. Their only means of communication with the coast and the capital was by the most difficult and dangerous mountain roads. All freight was carried on pack mules, and the canyons were so steep and dangerous that men and beasts were frequently swept away by the mountain torrents.

The engineering difficulties to be surmounted in this work were chiefly those of access and transportation over mountain roads and rocky canyons. In some instances men had to be let down to their work 200 ft., by ropes from overhanging cliffs, while in others the barefoot Chilano natives were employed on smooth rock slopes of forty degrees inclination, being held from falling by ropes about their waists. The description of the dangers and difficulties of the project was graphically written and well illustrated the almost superhuman achievements of modern railroad enterprise aided by scientific engineering skill.

After the reading of this paper, the Convention adjourned for the day. In the afternoon the members went on an excursion by the St. Louis, Kansas City & Northern Railway, to the St. Charles Bridge, and returned from there to St. Louis by treamboat. It had been intended to stop at the St. Louis water-works, but the hour was so late when the boat arrived there that the visit was postponed.

#### SECOND DAY.

The Convention met at 9 o'clock, and, after various announcements were made, a paper by Mr. D. J. Whittemore, Chief Engineer of the Chicago, Milwaukee & St. Paul Railway, was read on

#### TENSILE TESTS OF CEMENT.

In it he explained the difficulty of obtaining reliable tests, and an appliance for making more accurate determinations was exhibited, its advantages being fully shown. The appliance is Mr. Whittemore's invention, but he stated that he had never patented it because he did not think the use of such inventions should ever be restricted. He wanted everybody to use it. He gave the results of various experiments with the usual experience that different kinds of cement generally increases in tensile strength with time, though in different degree. From what he had noticed, he had thought that perhaps the water in which samples of hydraulic cement was placed absorbed carbonic acid from the air and imparted it to the cement. He accordingly procured eight specimens of Portland and American cement, and placed four of them in distilled water hermetically sealed in glass jars, and the others in the water of common use. The specimens in the sealed tubes soon became covered with a scale of hydrate of lime, which, upon exposure, was converted into a carbonate. No such result was noticed in the specimens unsealed in the undistilled water. After forty days, an analysis was made of all the specimens. None of the American cements had absorbed any carbonic acid at all, but the Portland had absorbed slightly. But it was found that the specimens placed in the distilled water and sealed jars were all stronger than any of the others, and their average tensile strength was 21 per cent. greater. The speaker did not think from his experiments that the American cements absorbed carbonic acid at all.

The subject was elaborated at some length and various deductions made. A short discussion followed, after which Mr. F. O. Norton's paper on

#### AMERICAN CEMENTS.

was read by the Secretary, Mr. Norton having arrived late in consequence of the delay of a train. The paper gave the result of a very large number of tests which were undertaken some time ago in consequence of the deterioration of some of the best known brands. Some of the results mentioned were: The conclusion that good and reliable cement can be made from the Ulster County, N. Y., material, by care in manufacture. Also that while a mixture made with a small amount of water gives a better degree of strength up to about three and a half months after setting, a wetter mixture proves stronger after that time. The reduction of strength of American cements with sand seems to be less than that of Portland similarly treated.

In the discussion which followed Mr. Francis said he visited an establishment on the Thames where the Portland cement was made. The material used was chalk from a neighboring hill, mixed with a kind of mud dredged from the river. The process of grinding and roasting was very simple, and it seemed wonderful that such extraordinary strength was developed.

Another member gave instances in which one kind of cement in ten minutes was stronger than others in 24 hours, but the quick-setting cement after a time deteriorated so as to become worthless, while the other grew stronger by age.

An inquiry was made as to experiments in transverse strains.

Mr. Norton said he had made no such tests. It was stated that the English cements gave far better test in this respect than any American brand.

Mr. Chesbrough said he had found sometimes that an

inferior rejected cement, mixed with a good reliable brand, would result in an excellent quality. In fact he had never seen better than some made in this way.

Mr. Whittemore said he had tested cements from a dozen different layers in the same bank, and there were no two layers which mixed would not give a better result than any single layer.

#### OTHER PAPERS.

The next paper was on the subject of "Waterproof Covering," by F. Collingwood. It gave the results of a number of experiments with Trinidad bitumen with various substances for roofing, road-making, etc.

A paper of D. A. Sweet, on "Strains on Trusses," was ordered printed in the proceedings. A paper on the "Ultimate Crippling Strength of Wrought-Iron Columns," by C. L. Gates, was similarly disposed of.

#### COMMITTEE REPORTS.

The report of the Committee on Tests of American Iron and Steel was called for.

The Secretary stated that Gen. Sooy Smith, Chairman of the Committee, was absent in Europe. He had stated that unless the action asked for was taken by Congress, the results of the Committee's labor would be lost.

The committees on "Gauging of Streams," "Providing Uniform Tests for Cements," and "Preservation of Timber" were called, but none were ready to report.

The report of the Finance Committee was read by the Secretary. An increased expenditure had been made on the library and cataloguing the books. Some embarrassment had been experienced from delinquency in dues, but the Society was more prosperous financially than ever before.

The following gentlemen were then appointed a committee to nominate officers for the ensuing year: Mr. Theodore Cooper, of New York; Mr. Frederick Graeff, of Philadelphia; Mr. Wm. E. Merrill, of Cincinnati; Mr. E. T. Chesbrough, of Chicago, and Mr. Shaler Smith, of St. Louis, were elected.

#### EXCURSION.

After the convention adjourned, at noon, the members made an excursion on board a steamboat to the water-works. The low-service engine-house was first visited, Col. Flad, Sewer Commissioner Moore, Judge John H. Lightner, President of the Council, and Chief Engineer A. J. Chappe doing the honors for the city. From the low-service works the visitors passed on to the settling-basins, which were in condition to illustrate all the phases of their use. One was full of water standing to be cleared of sediment. Another, from which the water was being drawn off, was half empty. A huge stream of water from the pumps was rushing in to fill the third, while the fourth was empty of water, its bottom showing a broad expanse of mud, which a gang of laborers were busy cleaning out. This process particularly interested the strangers, and nearly all had some improvement to suggest as to the method of removal. The deposit was about a foot deep, being the settling of about three months. The laborers cut a channel through and then kept a stream of water running close against the edge of the bank. Each has an implement similar to that ordinarily used in cleaning stables, made of a piece of board a couple of feet long and seven or eight inches wide, with a long handle fixed in the centre of it. The men chop out and loosen great chunks of the mud and push them along with the stream till the slushy mass reaches the outlet sewer and is swept into the river. The visiting engineers could hardly believe that this crude process was the result of nine years experimenting with all sorts of processes and devices. After a visit to the high service works and a look at the big engines, pavement tester, sprinkler and meter display, the party returned to the boat and were soon on their way to the Vulcan Iron-works. After a brief visit they returned to the boat and landed at the Meier Iron-works on the Illinois shore, about a mile above Carondelet, and thence were taken to East St. Louis and returned across "The Great Bridge." Capt. Eads, Col. Flad, Mr. Pfeiffer, General Smith and Mr. Taussig gave the visitors all the information desired concerning this celebrated structure.

#### THE NIGHT SESSION.

Shortly after eight o'clock the evening session commenced, the attendance being very large. After the meeting was called to order by Capt. Eads, the Secretary read an address by the Vice-President of the society, Mr. O. Chanute, Chief Engineer of the Erie Railroad, who was compelled to be absent on account of a sprained ankle. The subject was

#### PROGRESS OF ENGINEERING IN AMERICA.

It opened with a general reference to the subject. Man at the end of the eighteenth century was ceasing to utilize natural power in its larger and more coarse forms. From the introduction of the steam-engine the engineer has become a most important agent, and his art is well defined by Telford, as the director of those great natural forces that contribute to the prosperity and welfare of nations. Time had been when other countries were compelled to send to Holland for hydraulic engineers to redeem marsh-lands, but by the introduction of steam these primitive masters were soon exceeded in their science. In 1778 James Watts, after twenty years struggle with a difficult problem, succeeded in originating the steam-engine. It was a triumph which set men thinking, and the application of steam ensued in all its various branches. In one hundred years, more was accomplished for science and mechanism than during the ten previous centuries.

Allusion was then made to the wonderful growth of this country in all that pertained to engineering, and the high position the United States had attained among nations. The first subject treated of was

#### WATER-WORKS.

The system of supplying water to towns by means of water reservoirs was inaugurated by Hans Anderson, at Bethlehem, Pa., the water being conveyed to a wooden reservoir through hemlock logs. The idea was followed at Morristown. The subject of application of steam to water-works as first made on the Schuylkill River, at Philadelphia, was then treated; also the improvements made in pumping machines, engineers having made a gain in this respect of 50 per cent. over what was accomplished twenty years ago. Mr. Chesbrough, in laying his tunnel two miles under Lake Michigan for supplying Chicago with water, had accomplished a great engineering triumph. At present 500 towns in the United States and Canada were supplied with water reservoirs, employing 13,000 miles of pipe, 10,000 of which is of cast-iron. A comparison was made between the primitive means of water supply and the present convenient means which supplies every portion of the household with hot and cold water.

#### CANAL ENGINEERING.

There were 3,257 miles of canal in the United States, and there were improvements yet to be made in this class of propulsion. Mr. Baxter's experiments on the Erie Canal had not proven a success, and the Belgian wire-rope plan was being tried. Mr. John B. Jervis proposed to apply steam power for canal-boat propulsion, figuring a saving of over 87 per cent. by his system, through increase of speed.

#### RAILROADS.

The Americans were among the first to appreciate



Stephenson's invention of the railroad in 1825, and were but little behind the English in utilizing it. A table taken from a manual by Mr. H. V. Poor shows that the number of miles of railroad are as follows: Europe, 90,000; United States, 86,000; balance of the world, 25,000. The percentage being: Europe, 45 per cent.; United States, 43 per cent.; balance, 12 per cent. The cost of construction in this country is \$58,900 per mile, less than half that of Europe. Our engineers have introduced means that have proved cheap and efficient, and our engines pull heavier trains and make more miles in a year. The average made by an engine in Europe is 15,720 miles; in the United States, 21,900 miles per engine. While our engineers have given engines and cars greater freedom and ease of movement, the result of our sudden turns and steep grades, there are many things in engine construction, notably in boiler-making, which might be utilized here with benefit. The Pennsylvania Railroad—if not the best, one of the best-managed roads in the world—has been at great expense in testing improvements, and the new freight cars being tried promise to surpass all others. Our engineers have done fine work in contributing to the safety of travel, ride the instances of the safety platforms, power-brakes, etc., which improvements, notwithstanding the lightness of our roads, make travel here as safe as in Europe. The improvements in the matter of automatic signals are remarkable, and much more will be developed in their line. Sharp competition between lines has reduced the cost of transportation to as low rates as can be found elsewhere, and, notwithstanding the watering of stock process, a return of 3.93 per cent. is the average showing upon investments.

There are 3,500 miles of horse railways in the United States, but this means of transit is very slow. In London, the problem has been solved by underground roads. But the cost in this country would be \$1,500,000 per mile. New York had successfully elevated roads on girders which are sustained by iron columns. These roads cost \$300,000 per mile. A decided reduction is necessary to make rapid transit utilized in large cities, and a number of prominent engineers are studying the question.

## BRIDGES.

Engineers are necessarily the bridge-builders of the country. Iron and steel are now introduced in their construction with important success and give the greatest efficiency at the smallest cost. There are now in the United States 900 miles of bridges. One-third of them are of stone and iron, the two-thirds of wood, and these latter will have to be rebuilt by our engineers with the more durable material. Reference was made to the eye-bar and rivet in the accomplishment of spans, and it was designated the great principle of success in iron bridge-building. The chief defect in bridges is in the floor, and the less wood used on iron bridges the better it would be. The chief cause of accidents is by derailment of trains, and the tracks should be made as firm as possible. The question of material should not be forgotten; and I predict that the day is not far distant when steel will be produced at less cost than iron is at present by the puddling process. It has been used in the bridge at Glasgow, at St. Louis and is being used in the East River bridge at New York.

## RIVER IMPROVEMENTS.

are attracting great attention at present, and the fact is being realized that but little has been done toward river improvements as yet. Within a few years we must make river works. It has been demonstrated that even in the Missouri River the current can be controlled by building brush dikes. [The writer here paid a warm compliment to Capt. Jas. B. Eads for his great achievement in constructing the jetties at a cost of \$5,350,000, which answered the same purpose as the ship canal proposed, which would have cost \$10,000,000. This was greeted with loud applause.] The improvement of the Mississippi by deepening its channel and narrowing its width in sundry places attracted much attention. The movable dam on the Ohio has made success in its workings, and the idea was taken from the French, who originated it. We will improve upon it to suit the peculiar nature and requirements of our rivers.

The government has erected 626 light-houses and 727 river lights. [Here followed a lengthy table of statistics on buoys, signals, etc.]

The removal of the obstructions at Hell Gate, in the East River, by Gen. Newton, was a great feat of engineering. A shaft was sunk in the solid rock, which was tunneled and hinged in every direction, and the 4,427 apertures were exploded with 47,900 lbs. of rock-powder and dynamite, unsettling three acres of rock and sinking the channel of the river.

Gen. Newton is now engaged in blowing up eight acres of a similar nature, known as Flood Rock. The holes are bored by drills driven by compressed air.

## SHIP-BUILDING.

The cause of decay of the maritime trade of this country is owing to the unequal competition with England in ship-building and the superiority of iron over wooden vessels. The change began to take place in 1857, and notwithstanding that Robert Fulton, an American, first applied steam to navigation, and the Savannah, an American steamer, was the first to cross the ocean, our vessels, for the reasons stated, gradually disappeared from the sea. The cost of construction in this country is much less than it was ten years ago, and there is certainly a great field open for marine engineers. By use of machinery they can overcome the difference in cost of construction, and in time we can assume our proper place on the ocean.

## TELEGRAPHIC ENGINEERING.

It is very difficult to get statistics on this subject. On Jan. 1 there were 119,042 miles of telegraph in operation, and 299,250 miles of wire, not counting the district telegraphs, fire alarms, etc., in use in the cities. The Western Union Telegraph Company sent in one year 25,070,000 messages.

The telephone, when exhibited by Prof. Bell in 1876, was regarded as a toy. Now there are 121,000 instruments at work connecting our residences and business places, so that we can talk with another miles away.

## GAS ENGINEERING.

In 1850 there were 50 gas companies in this country; to-day there are 900, with a capital of \$200,000,000; and annually serving 20,000,000 cubic feet of gas; consuming 2,000,000 tons of coal. In competition with other illuminating agencies they have in Europe reduced the price of gas much below what it can be made for in America. Gas furnaces and other applications of gas were spoken of, and the subject of water gas touched upon. Time will show which is the cheapest of these processes.

## METALLURGY.

The wonderful increase of blast furnaces in this country is notable. There are now in operation sufficient of these to turn out 6,500,000 tons of iron per year. In this we stand second, England being first and Germany third. Our steel industry is second in the world and in a year it will be first. The growth since 1878, has been 50 per cent., and at present enough to lay or relay 18,000 miles of railroad can be produced annually. Mining was then spoken of, and allusion was made to the enormous products of gold and silver in this country. Special reference was made to the Comstock lode whose shaft was 3,000 feet deep where the temperature

was 103 degrees Fahrenheit and various appliances were necessary to prevent mortality to the miners. The discovery of petroleum and its importance was spoken of and instances were cited where in sinking artesian wells gas has been struck, which was utilized, the town of Fredonia, N. Y., being thus lighted by natural gas.

## AGRICULTURAL ENGINEERING.

Before this branch all others became as the dust of the valley. In the plow alone wonderful improvements had been made, although in some of the older countries of Europe the same style of implement was in use as was used when the Saviour was born. In 1850 the New York Agricultural Association made trial tests and found in using the plow having the smallest draft a saving of \$8,400,000 was the result to the country per annum. Since that time the improvements have been so steady and important that a saving of \$45,000,000 is made over that time; and yet the plow of the future has not been invented, and it will probably be propelled by steam. Here is a fine field for the engineer. Other inventions, such as shellers, cultivators, etc., were alluded to, and a special tribute was paid to the most wonderful of agricultural implements, the self-

binder and reaper, with which a boy could work over from fifteen to twenty acres per day, the saving being estimated at one-third of the value of the entire crop, or \$100,000,000.

The cotton crop of the South is now picked and worked by old methods, and here the engineer must direct his attention and study out new paths. He must break loose from the ruts he has been running in and pay attention to these important fields—not being a promoter of schemes or a tool for the use of the magnates of Wall street.

The other topics treated upon were those of meat transportation and wood preservation. A high compliment was paid to Capt. John Ericsson, and a prediction was advanced that air would be navigated in time with ease and safety. The paper closed with a comparison between American and English engineers, in connection with some practical suggestions regarding the future gatherings in order to draw out the full engineering talent of the country.

A vote of thanks was extended to Mr. Chanute.

Afterward an executive session was held and the committee adjourned.

For Thursday an excursion to Iron Mountain and Pilot Knob was proposed.

## Range of Stocks from Jan. 1 to May 25, 1880.

The table below, which we copy from the *Commercial and Financial Chronicle* of May 29, presents a list of all the stocks of steam railroads now on the New York Stock Exchange list, together with the total amount of their capital stock outstanding, which is seen to be \$1,153,492,553. The highest and lowest prices for the current year, to and including May 25, are also given, and the per cent. of difference between the extreme points reached. The last three columns show the lowest prices made on May 25, which was the culminating day in the recent stock decline; the difference between the highest point of the year and the lowest on May 25; and finally the amount represented in round figures by this decline, which appears to be \$200,913,259.

## RANGE IN PRICES OF STOCKS AT THE NEW YORK STOCK EXCHANGE.

NAMES.	Amount of stock outstanding.	RANGE FROM JAN. 1 TO MAY 25, 1880.				Lowest price May 25.	Decline from highest price of year to lowest on May 25.	Amount rep-resented by this decline, in round fig-ures.
		Highest.	Lowest.	Difference.				
					P. c.			
Albany & Susquehanna.	3,500,000	110 1/4	March 29	100	Jan. 2	10 1/4	107	\$ 105,000
Boston & New York Air Line, preferred.	2,240,500	61 3/4	Jan. 15	40	May 12	21 3/4		
Burlington, Cedar Rapids & Northern.	5,500,000	80 1/4	March 29	50	May 25	30 1/4	30	1,050,000
Canada Southern.	15,000,000	74 1/4	Jan. 14	40	May 17	34 1/4	48 3/4	3,750,000
Cedar Falls & Minnesota.	1,587,000	29	March 31	14	Jan. 16	15		
Central of New Jersey.	18,563,200	100 1/4	March 8	45	May 25	45 1/4	45	8,353,440
Central Iowa, common.	2,100,000							
1st preferred.	1,067,800							
2d.	1,167,800							
Central Pacific.	54,275,500	87	Jan. 29	63	May 14	24	63	13,026,120
Chesapeake & Ohio, common.	15,906,138	25 3/4	March 1	15	May 10	10 3/4	15	1,590,014
1st preferred.	5,447,803	35	March 6	24 1/2	May 19	10 1/2		
2d.	7,038,965	27 1/4	March 6	17	May 7	10 1/4		
Chicago & Alton, common.	10,063,300	116	March 29	89 1/2	Jan. 6	26 1/2	103 1/2	1,207,830
1st preferred.	2,425,400	127	April 8	117	Jan. 6	10		
Chicago & Northwestern, common.	14,988,067	97	March 31	87 1/2	May 11	9 1/2	87 1/2	1,348,083
1st preferred.	21,525,002	110 1/4	March 23	104	Feb. 10	6 1/4	100	861,024
Chicago, St. Paul & Minneapolis, common.	4,000,000	60 1/2	April 10	44 1/2	May 25	15 3/4	44 1/2	60,000
1st preferred.	1,000,000							
Chicago, Rock Island & Pacific.	20,980,000	104 1/4	April 14	149	Jan. 2	45 1/4	187 1/2	1,408,000
Chicago, Burlington & Quincy.	31,004,456	152	Jan. 26	113 1/2	May 25	38 1/2	113 1/2	11,781,693
Chicago, Milwaukee & St. Paul, common.	15,404,261	85 1/2	March 27	69 1/2	May 25	16 1/2	69 1/2	2,772,767
1st preferred.	12,249,483	107 1/2	March 29	99	May 10	8 1/2	99	982,359
Chicago, St. Louis & New Orleans.	11,339,400	48	Jan. 21	23	May 11	25	23	2,834,100
Cincinnati, Sandusky & Cleveland, common.	4,500,000							
1st preferred.	423,000							
2d.	3,500,000							
Cincinnati, Hamilton & Dayton.	11,244,250	114	April 29	106 1/2	Jan. 2	7 1/2	112	224,874
Cleveland & Pittsburgh, guaranteed.	14,991,800	82 1/2	Feb. 24	61	May 25	21 1/2	61	3,148,278
Cleveland, Columbus, Cin. & Indianapolis.	13,638,972	25 1/2	Jan. 26	9 1/2	May 11	15 1/2	10	2,090,846
Columbus, Chicago & Indiana Central.	26,200,000	94 1/2	March 22	68 1/2	May 25	26 1/2	68 1/2	6,812,000
Delaware, Lackawanna & Western.	3,000,000	71 1/2	March 27	60	Jan. 16	11 1/2		
Dubuque & Sioux City.	1,908,400							
Erie & Pittsburgh.	6,000,000	23	Feb. 13	22	Feb. 13	1		
Frankfort & Kokomo.	9,108,700	42 1/2	Feb. 24	23 1/2	May 25	19 1/2	42 1/2	1,742,053
Hannibal & St. Joseph, common.	3,083,024	76	Feb. 24	63 1/2	May 25	12 1/2	63 1/2	600,000
1st preferred.	7,950,000	180	Feb. 26	158	Jan. 2	22		
Harlem, common.	1,500,000							
1st preferred.	7,722,900	91 1/2	March 9	49 1/2	May 17	41 1/2		
Houston & Texas Central.	29,000,000	110	March 31	109 1/2	Jan. 2	1 1/2	100 1/2	2,610,000
Illinois Central.	2,500,000	45 1/2	Jan. 27	25	May 11	20 1/2		
Indiana, Bloomington & Western.	5,500,000	50	Feb. 25	39	April 29	11		
International & Great Northern.	1,500,000							
Joliet & Chicago.	2,600,400	111 1/2	March 4	97 1/2	May 25	13 1/2	97 1/2	6,500,000
Lake Shore & Michigan Southern.	3,600,000	20 1/2	Jan. 13	9	May 13	11 1/2		
Keokuk & Des Moines, common.	1,524,000	41	Jan. 12	26	May 14	15		
1st preferred.	9,052,950	164 1/2	April 2	80 1/2	Jan. 8	78 1/2	120	444
Louisville & Nashville.	3,200,000							
Long Island.	7,000,000	38 1/2	March 4	20 1/2	May 11	18 1/2	21	17 1/2
Lake Erie & Western.	3,000,000	160	Feb. 21	55	Jan. 3	54		
Louisville, New Albany & Chicago.	5,000,000							
Manhattan Beach Company.	18,738,204	95	March 5	75	May 17	20	75	3,747,041
Michigan Central.	21,405,000	49 1/2	Jan. 27	28 1/2	May 25	21 1/2	49 1/2	4,495,050
Missouri, Kansas & Texas.	15,000,000	110 1/2	Feb. 28	100	May 24	10 1/2	101	1,350,000
Morris & Essex.	5,330,000	29 1/2	March 8	12	May 7	17 1/2	13 1/2	16 1/2
Mobile & Ohio.	13,000,000	57 1/2	March 16	24	May 18	33 1/2	25 1/2	32 1/2
Manhattan Elevated.	8,130,719	18	Jan. 12	6	May 7	12	6 1/2	11 1/2
Marietta & Cincinnati, 1st preferred.	4,460,368	12 1/2	Jan. 12	3	May 12	9 1/2		
2d.	5,312,725	39 1/2	April 3	39 1/2	April 3	0		
Memphis & Charleston.	6,500,000	121	Jan. 3	92	April 2	29	93	1,820,000
Metropolitan Elevated.	6,500,000	127 1/2	Jan. 15	112	April 2	15 1/2	112 1/2	910,000
New York Elevated.	89,428,300	137	March 31	122	May 11	15	122 1/2	12,190,062
New York Central & Hudson River.	15,500,000	163 1/2	May 25	155	Jan. 2	8 1/2	162	1 1/2
New York, New Haven & Hartford.	77,107,700	18 1/2	Feb. 2	30 1/2	May 25	18 1/2	30 1/2	13,879,390
New York, Lake Erie & Western, common.	8,146,700	75 1/2	Feb. 2	47	May 25	28 1/2	47	2,118,142
1st preferred.	35,000,000	3 1/2	Feb. 19	23 1/2	Feb. 14	8 1/2	25	6 1/2
New York, Ontario & Western, common.	2,000,000	84	Feb. 19	76	May 4	8		
1st preferred.	29,952,000	30	Jan. 14	20	May 11	10	20 1/2	15 1/2
Northern Pacific, common.	43,800,000	60	Jan. 13	39 1/2	May 24	20 1/2	40	8,700,000
Nashville, Chattanooga & St. Louis.	6,575,295	128	March 5	60	May 25	68	60	4,471,201
North Wisconsin.	600,000							
Ohio & Mississippi, common.	20,000,000	44 1/2	Feb. 26	23	May 25	21 1/2	23	21 1/2
1st preferred.	4,000,000	84 1/2	Feb. 24	57 1/2	Jan. 2	26 1/2	69 1/2	15
Ohio Central.	4,000,000	28 1/2	Feb. 19	14	May 11	14 1/2	17 1/2	10 1/2
Panama.	7,000,000	190	April 3	168	Jan. 2	22	170	20
Philadelphia & Reading, common.	32,726,375	72 1/2	Jan. 3	17 1/2	May 24	55 1/2	18 1/2	59 1/2
1st preferred.	1,551,800							
Pittsburgh, Fort Wayne & Chicago, guar.	19,714,285	119 1/2	March 23	112	Jan. 2	7 1/2	118	197,144
1st preferred.	6,329,300							
Pittsburgh, Titusville & Buffalo, common.	6,329,300							
1st preferred.	480,000							
Peoria, Decatur & Evansville.	3,500,000	28 1/2	March 22	18	May 11	10 1/2		
Rensselaer & Saratoga.	7,000,000	120	Jan. 22	111	Jan. 17	9		
Rome, Watertown & Ogdensburg.	5,293,100	35	Feb. 14	20	Jan. 2	15		
St. Louis, Alton & Terre Haute, common.	2,300,000	31	Jan. 14	15	May 14	16		
1st preferred.	2,408,400	70 1/2	Jan. 14	42 1/2	Jan. 2	28		
Belleville & Southern Illinois.	1,250,000							
St. Louis, Iron Mountain & Southern.	21,202,001	46	Feb. 17	34 1/2	May 25	11 1/2	44 1/2	31 1/2
St. Louis & San Francisco, common.	8,573,300	48	Feb. 2	25 1/2	May 11	22 1/2	29	19
1st preferred.	9,768,400	60 1/2	March 8	33	May 11	27 1/2	38 1/2	21 1/2
2d.	3,721,720	83 1/2	March 9	60	May 11	23 1/2	61	22 1/2
St. Paul & Duluth, common.	4,055,400	40	Feb. 28	37	April 20	3		
1st preferred.	4,823,800	70	Feb. 28	65	April 21	5		
St. Paul & Sioux City, common.	5,887,500	43 1/2	March 29	35	May 25	18 1/2	35	10 1/2
1st preferred.	5,887,500	83 1/2	Feb. 17	71	May 11	12 1/2	72	11 1/2
St. Paul, Minneapolis & Manitoba.	15,000,000							
Terre Haute & Indianapolis.	1,988,000							
Toledo, Peoria & Warsaw.	3,000,000							
Texas & Pacific.	7,700,000	47 1/2	March 3	30	May 13	17 1/2	80 1/2	17 1/2
United New Jersey Railroad & Canal.	20,490,400	161	May 7	157 1/2	Mar. 25	3 1/2	80 1/2	21 1/2
Union Pacific.	50,762,200	97 1/2	Jan. 19	80	May 11	17 1/2	80 1/2	17 1/2
Wabash, St. Louis & Pacific, common.	20,000,000	48	Jan. 27	29 1/2	May 25	21 1/2	51 1/2	21 1/2
1st preferred.	20,000,000	72 1/2	Jan. 27	21 1/2	May 25	21 1/2		
Warren.	1,800,000	100 1/4	Jan. 17	100	Jan. 12	3		
Total.	1,153,492,553							



## Locomotive Boiler Construction.

[Paper submitted at the thirteenth annual convention of the Master Mechanics' Association by Jacob Johann, Master Mechanic of the Western Division of the Wabash, St. Louis & Pacific Railway.]

Mr. President and Gentlemen of the American Railway Master Mechanics' Association:

In previous meetings of this Association, I have expressed myself very strongly in favor of the "straight-top" type of locomotive, boiler, and I propose in the following paper to give my reasons for such a preference.

Owing to the character of the water used on our roads, we have been troubled in the past by heavy deposits of sediment, which, despite frequent washings out, will, in the course of a year's time, completely fill the space between the crown-bars and a large proportion of the space between the flues.

This sediment, after it becomes hard, as you are all well aware, cannot be removed short of the chisel and hammer and by rolling the flues.

The proper way to remedy this evil, would be to purify the water before it gains admittance to the boiler; but as this so far has not been done in a satisfactory manner, it becomes necessary for us to reduce the effects of these deposits to a minimum by a mechanical contrivance in the structure of the boiler itself.

The first thing that suggested to me, conducing to such an end, was to lessen the liability of sediment lodging on the crown-sheet, and becoming baked and converted into scale.

This I have endeavored to accomplish by arching and sloping the fire-box crown-sheets as much as was permissible, and by using long stays in place of crown-bars. The reasons presenting themselves for adopting such a course being as follows:

First. For sloping and arching.

It was obvious that the sediment would be less liable to be deposited on a sloping and arching surface than on a level surface, and at the same time the arching would aid, in a great measure, in supporting the crown sheet.

Still another advantage presents itself, which, though having no bearing on the lessening of deposit, was of no small importance, namely:

Owing to the sloping and arching, and to the fact that the gauge-cocks are set from the highest point on the crown, there is no possible chance of uncovering the crown-sheet while going up or down a heavy grade, or in the rolling of the engine while rounding sharp curves, as long as the boiler shows one gauge of water on a level; while with the straight crown such danger has frequently manifested itself by burnt crown-sheets.

Second. For the use of long stays.

The use of crown-bars with their accompanying bolts and washers causes a considerable portion of the heating surface of the crown to be nullified, and, at the same time, furnishes a most ready means for the lodgment of sediment, with the still farther disadvantage of rendering the surface almost inaccessible for purposes of scraping and cleaning.

It is no infrequent occurrence to find the space between the bars and the crown-sheet completely filled with hard scale as well as a large portion of the space between the bars.

By using long stays it is obvious that the liability of deposit is diminished in a great degree, and an almost perfectly open crown-sheet secured, which is easily accessible for the purposes of cleaning and washing.

The use of these long stays necessitates the placing of the dome in front of the fire-box, which I, however, consider an advantage instead of a detriment, for the following reasons:

1st. It is nearer the centre of longitudinal oscillation of the boiler, and consequently there is less agitation of the water at that point, and less liability of washing and priming.

2d. It places the dome more nearly over the point where the greatest amount of steam is generated.

By using a large dome and dome-ring opening, a boy may be let down at any time with hose and scraper, and readily remove any scale that may have accumulated, without disturbing the throttle-pipe.

As to the weakening effects of placing the dome over the barrel, I have prevented them by flanging the boiler sheet as well as the dome sheet, and using in addition a  $\frac{3}{4} \times 6$  in. wrought-iron ring, which takes the dome flange rivets, and at the same time is riveted to the boiler sheets by independent rivets.

For keeping the barrel of the boiler free from sediment, I have succeeded most admirably by spacing the flues further apart and using a less number, and by the employment of a boiler washing device which was explained to the convention at the last annual meeting, a description of which may be seen in the last printed report of proceedings.

This device keeps the bottom of the boiler clear, and prevents the forming of a foundation for the sediment to climb up between the flues. In fact, so perfect is the working of the washer, that upon opening the boiler at any time for inspection after washing out, the rivet heads are seen as plainly as when the boiler was first made.

The first one I used was put in the boiler of an engine, in August, 1878 and on opening the boiler for inspection in April, 1880, the bottom of the boiler was found to be perfectly clear and the flues in reasonably fair condition. Without this device we would have been compelled to remove the whole or greater portion of the flues, at least within a twelve-month from the time of being put in.

In summing up, you will observe that I have endeavored to go to work in a systematic manner, and reduce to a minimum the evil effects arising from a rapid sedimental deposit by mechanical contrivances in the boiler structure itself, and the results attained have convinced me that I have succeeded in a great measure in so doing.

To determine the practicability, to my own satisfaction, of the use of long crown-stays instead of crown-bars, for the purpose of lessening the chances of the deposit of sediment on the crown-sheet, I constructed in January, 1879, a straight boiler for a 15 x 22 in. cylinder engine, with an inside diameter of 46  $\frac{1}{2}$  in., the dimensions of the fire-box being as follows:

Length, 59 in.; height, sloping, 62 in. in front, 57 at back; width at bottom, 34  $\frac{1}{2}$  in.; at the top, 39  $\frac{1}{2}$  in., the crown-sheets being arched with a radius of 35  $\frac{1}{2}$  in., the horizontal angles being round, with a radius of 10 in.

This boiler has been in service since April, 1879, having entirely come up to my expectations, and is to-day in perfect condition.

This engine is engaged in running passenger trains of five or six cars each, between two points on the road, together with three other engines of the same sized cylinders. The latter having much larger heating surface, but less water capacity; and although no special tests have been made, the average miles run to the ton of coal, from May, 1879, to April, 1880, shows most favorable results for the boiler with the least heating surface, but larger water capacity—which increased water capacity is due to the absence of crown bars, the arching and sloping of fire box, and a less number of flues.

This average for the time stated was 42.43 miles run to the ton of coal used, while the other three made 40.69, 35.90 and 36.00 miles to the ton respectively.

The success of this boiler encouraged me to build another

on a larger scale, and during the summer of 1879 I built two 17 x 24 in. cylinder engines of standard pattern, being identical throughout with the exception of the boilers.

For one I built a "wagon top" boiler, using crown-bars and a flat crown-sheet. The following being the general dimensions:

Boiler tapering, 49 in. inside diameter at front, 52 in. at back.

Rise of wagon-top, 10 in.

Fire-box, length 66 in.

" width, 84  $\frac{1}{2}$  in.

" height, 70 in.

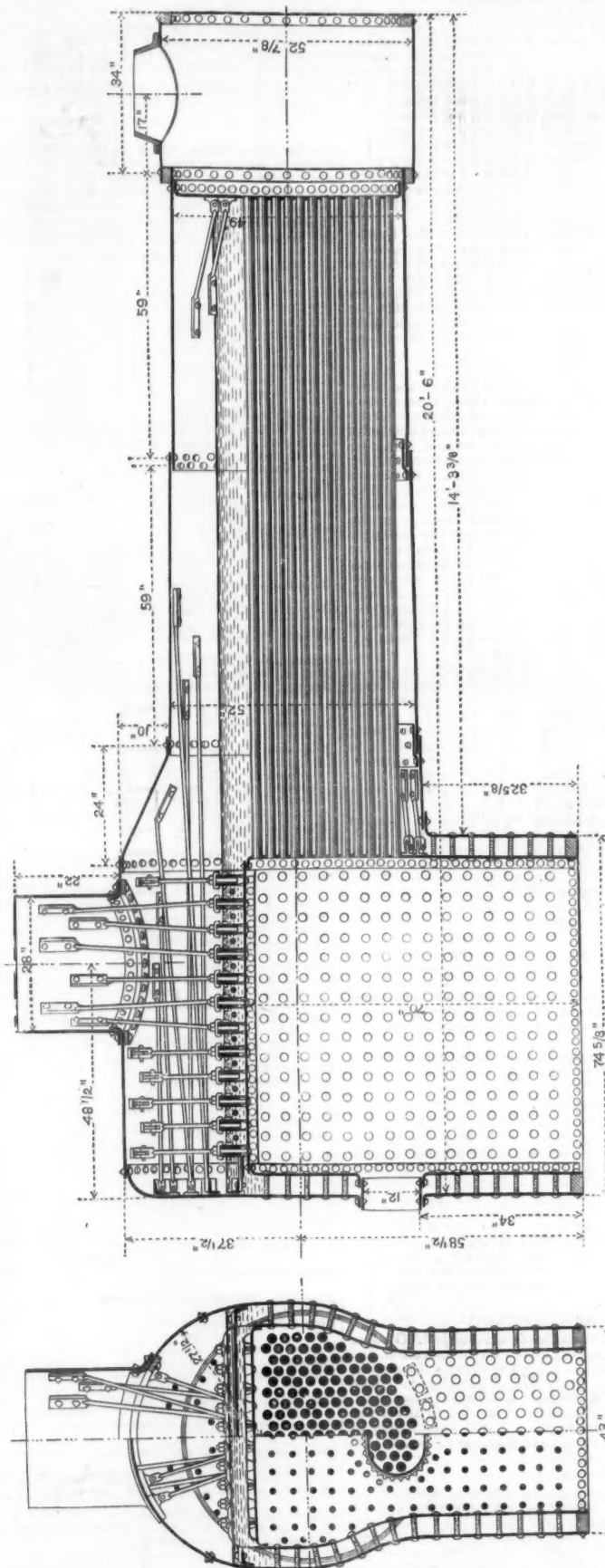
Water space, 3  $\frac{1}{2}$  in. all around.

Height, back head, 96 in.

I used steel as the material for these boilers and fire-boxes, the barrels being  $\frac{7}{8}$  in. in thickness riveted with  $\frac{3}{4}$  in. rivets, being made of extra strength for the purpose of carrying 150 lbs. pressure; the stay-bolts also being of steel, with the exception of the long stays in the straight boiler, which are of Sligo iron.

The chief difficulty I encountered in the case of the straight boiler was in overcoming the disadvantages of the acute angle, at which the long stays on the outer rows passed through the crown-sheet and shell, this angle being so sharp in some cases that the outside shell would not have one complete turn of the thread on the stays.

I overcame this difficulty, however, by running the side-sheets entirely to the top, allowing them to butt together,



WAGON-TOP BOILER.

Flues, 190 in number, 2 in. outside diameter, 11 ft. 6 in. long.

For the other I built a straight boiler, using an arched and sloping crown, stayed by long stays to the boiler crown, of the following general dimensions:

Inside diameter of smallest ring of boiler, 52 in.

Height of back head, 87 in.

Fire-box, length, 66 in.

" width, 84  $\frac{1}{2}$  in.

Height, sloping, 70 in. at front, 64  $\frac{1}{2}$  in. at back, slope being at the rate of 1 in. to the foot.

Crown-sheet, arched 35 in. radius, with round angles, 13 in. radius at the flue-sheet, 10 in. radius at fire-door sheet.

Flues, 160 in number, 2 in. outside diameter, and 11 ft. 6 in. long.

and then running down over them an extra sheet far enough to receive all the long stays.

The stays were then extended up nearly normal to the crown-sheet, the arching of the crown rendering this possible, and the double thickness of the shell furnishing sufficient hold for the stay bolt threads, this extra sheet at the same time materially increasing the strength of the boiler-crown.

These stays are one inch in diameter, the outer ends being upset to an inch and an eighth for a short distance, the fire-box crown being tapped for an inch and the boiler crown for an inch and an eighth bolt, special taps and reamers being made for the purpose. The outer end of these stays, after they were screwed into position, were riveted over to a reasonably sized head, while the inner ends were merely







road, Mr. H. S. Haines, who has before proved his familiarity with railroad affairs and his ability to discuss them, replied at length in a letter to the *Savannah Morning News*, the chief part of which is copied below:

When the first tariff made by the Commission was published, we examined it carefully and were satisfied that, if applied to the business of the company, we could not earn the interest on its bonds. We so wrote to the Commission and asked to be allowed to appear before them with an argument to that effect. We were permitted to do so, and presented a printed statement showing our average earnings and expenditures for the past eight years. Also that our earnings would be decreased about \$180,000 per annum if that tariff was put in effect, and that with such a decrease we would not earn enough by \$80,000 to pay the interest on our bonds. That argument is now in possession of the Commission, and I call on the *Constitution* to publish it, and let the public see whether it was plain enough to be understood.

The Commission received us politely, complimented us upon our argument and told us to go home and look in the newspaper and we would find out what they proposed to do with our road. I will add that this argument was supported by statements taken from the books of the road by the Treasurer, who accompanied me to Atlanta to make affidavit to their correctness, which we were told was not necessary.

We did go home, and saw in the newspapers that we were permitted to charge 20 per cent. more than the first tariff. The very figures which we had already furnished the Commission were enough to show that this increase in the rates would not yield sufficient earnings by forty-eight thousand dollars to pay our interest. When I stated this to the Commission, I was told to "try it for a month or two." We had tried it, not by shipping so many boxes of merchandise and so many bales of cotton, but by applying their rates to the business of the previous December item by item, and the result was just as certain as if we had shipped the very articles over again. What was the use of spending from ten to twenty thousand dollars a month to see how much we would lose, when we could try it just as well upon shipments already made, and when neither the state nor the Commission would make good any loss occasioned by such experiments. But the *Constitution* says that we based our calculations only upon the month of December, 1879. Still, since we knew what proportion the business of that month bore to that of the whole year, it was an easy sum in arithmetic to apply the same percentage of loss to the whole business and get the result. When this argument was made, time was precious, and we had to work early and late to get what facts we could. Subsequently we applied their rates to six months' business, at a cost of nearly \$300 for clerk hire, and found our original calculations to be sustained. The *Constitution* need not take my word for this, as the clerks who made the calculations will swear to their correctness.

Hard as it was we had to "try it." We had to face the certain loss of \$10,000 to \$20,000 per month, with the faint hope that the Commission might, after a time, consent to let us earn enough more to pay our interest and keep out of bankruptcy. If we did not, we exposed ourselves to excessive fines of \$1,000 or more for every failure to do so, and the law left us no appeal to the courts. It did not say if the rates made by the Commission were not just and reasonable the courts would protect us, but that if we charged more than their rates we would be fined for not complying with their orders.

So we put the rates into effect, and when we did so, we did away with free passes. And this has been held up as a great offense, intended to make the people dissatisfied with the Commission. I ask, what right had a company to pass any one free, that admitted that it could not earn enough to pay the interest on its bonds? This we had admitted; yes, had notified our creditors to that effect, as any man would do who was about to be unable to comply with his obligations by causes beyond his control, and our creditors went to the Court to ask whether these rates, that would not permit this company to earn enough to pay its interest on its obligations, were the "just and reasonable rates" that the Legislature intended when the railroad law was made. In this way the case got into the courts—not with the idea of defying the constitution and the laws of the state, or of trampling on the rights of the people, nor with any political object; simply to keep from being bankrupted, if it so happened that the law was not intended to be so applied.

The case is in the courts, and there I leave it. If the bondholders are mistaken I do not doubt that the lawyers for the state can make it so appear to the court; if they are not mistaken, if the Legislature did not intend for railroads to keep trying rates until they broke at it, why should not all lovers of justice and fair play rejoice with them that the Legislature of Georgia never intended to take private property for public use without just compensation? I beg that your readers will bear in mind that this "rapacious corporation," of which the *Constitution* speaks, is not trying to wring enormous dividends from its patrons. It is trying to earn the interest on its bonds, and if it had been allowed to do so, its bondholders would never have cared whether the acts of the Railroad Commission were constitutional or not.

This is the head and front of our offending, and for this our corporation has been pilloried. I may say persecuted, by the Atlanta *Constitution* to an extent that is so totally out of keeping with the magnitude of our offenses, that we may well believe that its virtuous abhorrence of evil-doers is but the pretence, and that some other motive is the hidden mainspring of this machine-made indignation against a corporation which has had the temerity to protest, in a lawful way, against the official acts of three paid officials of the state, that threatened its existence. If the law is not constitutional, it ought to be known, and this can only be ascertained by a judicial decision; but this is a lawyer's question, which I am not competent to discuss. Whether it is so or not, to me it seems a very good law if some of its defects were remedied, for it provides for just and reasonable rates for the railroad, and prevents unjust discrimination against the people. This ought to satisfy every one. The railroads are to earn a fair profit, and one section is to have no advantage over another; one town is not to be permitted to draw trade away from another, and all individuals are to be treated alike. If the Commission will earnestly attempt to bring about this state of things, we will gladly sustain them to the extent of our ability. But the law provides no check upon the Commission in case it should go wrong. Had the Governor been mistaken in weighing the qualifications of his appointees; had he selected men who were ignorant of the principles governing the operations of railroads, and too indolent to learn; had he chosen men who viewed their positions merely as stepping-stones to more desirable offices; had they been men capable of violent animosities, who bore a personal grudge against those who differed with them, and who would use their great power as a weapon of revenge, how unfortunate would be the plight of the railroad corporation or management that had to suffer from their incapacity, ambition or anger. There is no appeal from their decision, as the present incumbents informed the Governor in their report: "Our powers are positive, not negative; like thumbcrews, they take a powerful hold, so that even to litigate them is dangerous." There is nothing more unreasonable than irre-

sponsible power; the man who enjoys it will not brook opposition or criticism, and those who are in his power soon learn the proper way in which to approach him—not as a citizen appearing before a tribunal, conscious of the justice of his cause, by no means; you have not to convince, but to persuade; you must not argue, but flatter.

I have already commended the law and I have not assailed the Commission. It is composed of gentlemen well known to the community, and who are disposed to act honestly up to their convictions. They have treated me civilly when I was before them, and I have spoken of them in the same way whenever I have felt it my duty to discuss their official acts. That they have enormous powers, for good or for evil, over every railroad in the state, they do not deny; they avow it. There is no other official body in this state, nor, so far as I know, in the United States, of which it can be said with truth what they have said of themselves and of their official prerogatives. Is it likely, then, that the officials of a corporation, aware of their irresponsible authority, would have even questioned it, much less defied it, except under circumstances of the extremest urgency? Let the *Constitution* at least give us credit for honestly fearing bankruptcy as the consequence of their acts, even though it may prove, what it has not yet done, that we are mistaken; though it is apparent that, in the opinion of the *Constitution*, not even the fear of impending dissolution could justify a railroad company or its creditors in flying to the courts for protection against the Commission.

We are accused of having reduced the wages of our employees in order to make the Commission odious. When we found that the Commission insisted upon putting their rates into effect, we had to prepare to meet the impending storm as best we could, and as taking up free passes would not have added to our income enough to have kept us out of the United States Marshal's hands, it was necessary to reduce our expenses as speedily and extensively as possible. All work of improvement was to be stopped, we had to dismiss every man that we could possibly get along without, and to make some reduction in the pay of those who remained. This reduction was fixed at 10 per cent. upon all salaries over \$90 per month, and 5 per cent. upon all under that amount, but was not to affect the laboring men and others who did not get over \$1 per day. We had to assign a reason for this reduction, and we stated that it was owing to a reduction in our earnings that would follow upon the establishment of the Commission's rates. This was the real reason; and what other could we have given? If odium was to attach to any one, why should we have been compelled to assume it? Or were we to go on paying full wages and hasten the very bankruptcy we were endeavoring to avert?

The Commission's rates went into effect on May 1; the reduction of pay was not to take effect until one month later. One month's notice was given to all employees who wished to seek business elsewhere, and they were asked to give us fifteen days' notice of their intention to leave. When we found that it was not necessary, the order was suspended.

These are the facts, and what less could prudent business men have done under the circumstances? But that this step was taken to make the Commission odious, I deny. It shall not be said of me that I would, from such a motive, consent to reduce the wages of the men whom I have known for years—many of them since they were children—some of whom I have worked with side by side in the same occupation, who have worked for us night and day, in season and out of season, as faithfully as men could work. I know and esteem many of our employees too well to be willing to injure them for any such contemptible purpose as to make the commission odious. If a selfish motive must be suggested, I ought to care too much for myself to be willing to give up 10 per cent. from my only means of support merely to make the Commission odious.

Then, too, we would not furnish excursion trains for the Thomasville Fair, because we hoped to make the Commission odious to the people as well as to our employees. The fair was to take place on the first of May, and we were uncertain as to how the Commission might view special passage rates. There were clauses in their regulations that were capable of a construction forbidding them, and we informed the fair authorities that, as we were uncertain how to act, we thought it advisable not to make such rates until we had more experience with the workings of the new rates fixed by the Commission. But it is said that the regulations relieved the railroads from all restrictions as to passage rates. The publication made in the Atlanta *Constitution* did, but that published in the Albany *Advertiser* did not, although both bear the same date. We had used the *Advertiser* publication in making up our tariffs, and never knew that the regulations were published differently in the *Constitution* until it was too late to prepare excursion trains. To satisfy the *Constitution* that we acted properly under the circumstances, I will state that when the matter was brought to the attention of the Commissioners they informed me that they had amended their regulations as to passage rates, but that we were "right to go slow." So that the Commission does not object to our course in this matter if the *Constitution* does.

Our treatment of the lumber interest on our line has been cited as a striking example to prove, in the words of the *Constitution*, that "if the railroads are left to themselves they will not scruple to cripple interests in order to swell their gross earnings," and that we had selected the lumber interest as a victim in the inauguration of the opposition to the Commission.

The lumber interest is, indeed, an important one to the city of Savannah, and those familiar with the facts are well aware how sedulously it has been fostered by the management of this company. Last year, out of the 246,000 tons of freight which we transported, over 94,000 tons were lumber, taken at an average rate of less than a cent per ton per mile, and this rate was made so low in order to protect the lumber interests at Savannah and along our line. It was not done under the thumbcrew; it was the voluntary response of this "rapacious corporation" to the appeal of a local industry for protection. But times were getting better; lumber had advanced in price 25 per cent., and we were about to call a meeting of lumbermen to discuss an advance in rates; but just then we found that the Commission was about to make rates for us, and we concluded to wait and see what they would be. As soon as they were published, the lumber men found them so much higher than they had been paying that they came to us to know if we intended to apply them. Of course we took a little time to consider. The rates made for us on merchandise and cotton would make us lose over \$150,000 per annum; the rates made for us on lumber promised to make good some of the loss. These rates, it is true, were "maximum" rates, but they were also "just and reasonable," and between our duty to our bondholders and the lumber men, we thought that we ought to accept the little benefit that the Commission had done for us, as a set-off to the great loss they were to cause us. The lumber men went to the Commission, and we were forthwith summoned to appear before that tribunal. Both sides were heard. We had very little to say, except a piteous prayer that we might be allowed to hold fast to the one little crumb of comfort that the Commission had given us, but the lumbermen asserted that they would lose a great deal of money if the Commission did not lower the rates, and so the

Commission made a lower "maximum just and reasonable" rate, as they had the power to do, and which we would have been obliged to accept if the temporary injunction had not been granted. It is true that the first "just and reasonable" lumber rate was higher than our people had been accustomed to and higher than we should have probably fixed it; still if the law allowed us to charge it, why rail at a corporation threatened with bankruptcy for seizing at this only straw within its reach? And why, because the lumbermen complained, force a rate upon us lower than that permitted to be charged by the Western & Atlantic Railroad company. The lumbermen on our line are too well convinced of our desire to foster their business to be deluded by any assertions that we desire to "cripple their interest in order to swell our gross earnings." We are sufficiently well acquainted with their business to know how to make rates for them which will never "cripple their interests," and we would look upon such a course as but poorly adapted to "swell our gross earnings."

With this statement of facts, what have we done to make the Commission odious with the lumbermen? The latter party did not consider the rates fixed by the Commission as "just and reasonable," and when both appeared before that body it was our interest to show that the Commission had not made a mistake, and the lumbermen's business to show that they had. The Commissioners admitted that they had reduced the maximum rate to a point which allowed but very little, if any, more to us than we were getting, and we had to be satisfied with it. How then can the *Constitution* say that we had selected the lumber interest "as a victim in the inauguration of this opposition to the Commission."

The latest charge made by the *Constitution*, and the one which is accompanied by a personal assault upon my own truthfulness and morality, is contained in its issue of the 23d inst. It had already stated that we had reduced our rates 30 to 60 per cent. below the Commissioners' rate in order to compete with the Brunswick & Albany Railroad. The *Morning News* denied it "on the best authority," and correctly, as that authority was myself.

Now for the facts. In the trade made between the Brunswick & Albany Railroad and the Commission, that road was to be allowed to make its local rates as high for 10 miles as on other roads for 80 miles, for 20 miles as high as on other roads for 90 miles, and so on, until it charged as much for 170 miles as other roads were permitted to charge for 250 miles; with these exceptions, that for cotton from Albany, it was only to charge the Commissioners' lowest rate for that distance, say 170 miles, and also "certain millers' rates are confirmed." What these "certain millers' rates" are we do not know; for I am told that they are higher than we were permitted to charge. At all events, these changes of rates altogether upset our through rates between that road and Savannah, and we had to make new ones. We gave to the Brunswick & Albany Railroad Company the local rates which they were allowed to charge from their station to Waycross, the junction of our roads, and added to them for our own proportion an amount which we considered sufficient to meet the competition by steamboat through Brunswick to Savannah. We referred these rates to the management of the Brunswick & Albany Railroad for their approval. Although we gave them their full local rates to Waycross, all that the Commission allowed them to charge, they were not satisfied. They said those rates would strip their road and dry up Brunswick. Not wishing to precipitate such direful consequences, we did not put the rates in effect, but are still using the very rates of July 15, 1879, referred to in the *Constitution*, which give the Brunswick & Albany Railroad more from their stations to Waycross than they are entitled to charge from the same stations to Brunswick. Whether the people on the Brunswick & Albany Railroad who ship freight to Savannah will be satisfied or not with our explanation, the *Constitution* should be. We never made any rates to compete with that road. We proposed to that road certain rates based upon the Commissioners' rates. The Brunswick & Albany Railroad did not approve of them, and they were never used. We are giving the Brunswick & Albany Railroad more for freight delivered to us at Waycross than they get for carrying it sixty miles further. With this the Brunswick & Albany Railroad ought to be satisfied. What have we done in this connection that has made the Commission odious, and where have I failed to state the truth? Let the *Constitution* speak now or forever after hold its peace so far as we are concerned, for we cannot devote the rest of our lives to writing newspaper articles.

We are engaged in a work in which the public is more interested, and especially the people of Southern Georgia. We are devoting ourselves to developing the industrial resources of that region; to introducing new industries and stimulating old ones; to building lines of railroad through places that but for our efforts would never have been blessed with one, and we hope to be rewarded, not only by a just compensation on our investments, but also by the good wishes of all those who have been or are to be benefited by the present operations and future projects of the Savannah, Florida & Western Railway Company, of whose lines I subscribe myself the General Manager.

Very respectfully, H. S. HAINES.

#### RAILROAD LAW.

##### Rights of Express Companies.

A dispatch from Louisville, May 26, says: "Judge Baxter (of the United States Circuit Court) to-day rendered an opinion in the case of the Adams Express Company against the Nashville & Chattanooga and Louisville, Cincinnati & Lexington railroad companies. The decision was substantially the same as given by Justice Harlan in a similar case at Indianapolis, and is another victory for the Adams. The Judge sustains the motion of the plaintiff, and grants the injunction."

The following order was entered: "The motion of the complainant for a preliminary injunction herein, according to the prayer of the original and supplemental bill herein, having been brought on to be heard, and counsel for the respective parties having appeared and been heard, and the Court having duly considered the question involved, does hereby order that a preliminary injunction be issued herein restraining the said defendant, its agents, officers, and servants, during the pendency of this suit, from interfering with or disturbing in any way or manner the agreement by the Adams Express Company, of the facilities now accorded to it by the said defendant upon its lines of railroad for the transaction of the business of the said Adams Express Company, and of the express business of the public confided to its care, and from interfering with any of the express matter, or messengers, or employees from the depots, cars, and lines of said defendant, as the same have been heretofore, and are now, enjoyed and occupied by the said Adams Express Company, and from refusing to receive and transport, in like manner as the said defendant is now doing, over its lines of railroad, express matter, and messengers of said Adams Express Company, and from interfering with or disturbing the business of said Adams Express Company in any way or manner whatever; and from refusing to permit the Adams Express Company to continue the transaction of its said business over the line of the defendant on the same terms, conditions



privileges, facilities, and accommodations as are, or may be permitted or accorded to any other express company, or to or by the defendant itself in the conduct of an express business over its railroad line upon payment by the said Adams Express Company of all lawful and reasonable charges which may be properly demanded by the said defendant, or paid by such other express company, or by the public to the defendant therefor, not in excess of the rates authorized by its charter, and not in excess of the rates charged to others for similar services, nor of those received by the defendant from shippers of express matter, to be carried by the defendant as such. In the last case, less the reasonable cost of the occasional service rendered by the railroad lines and at the station for the trains of the said defendant, and with the liberty to the parties to make such further application herein to the Court as they may be advised, is necessary to fix what is, and shall be, a lawful and reasonable compensation, or for any other matter growing out of the case. In the event of a dispute between the parties pending the preparation of this cause as to what is reasonable compensation for the services performed by the defendant company, and what is a reasonable rebate to be allowed for such occasional service, such difference shall be referred to the Court after due notice, and, pending such reference, the complainant shall not be disturbed by the defendant company in the transaction of express business over its line.

"Judge Baxter, in his opinion, after alluding to the commencement of the express business, in 1839, under the auspices of Alvin Adams, and its growth, until to-day, when it is represented by 160 express companies, possessing an aggregate capital of \$30,000,000, and occupying every prominent railroad in the United States, says that, by the unity which now obtains among all the express companies, they are able to afford to the public all the facilities which the public demands, and to which it has become accustomed during a period of thirty years. During this period the railway companies have accorded freely all the facilities which the express companies have required, and in many instances have solicited the business of such companies, to the great profit of the railways. By recent changes, the Louisville & Nashville Railroad Company have obtained the control of long lines of railway, and have undertaken to organize a new express company, called the Union Express Company, and with a view of supplanting the Adams and Southern Express companies, has undertaken to the Union Company the exclusive use of the privileges heretofore accorded to the other two express companies. The Louisville & Nashville road seems to have been advised that this purpose to give such exclusive facilities would not stand judicial investigation, and, therefore, in order to effect the same purpose of excluding the Adams and Southern companies, now announce that the railway will conduct its own express business over the road for its own benefit. Hence the question is squarely presented: Can the defendants legally refuse to carry for the Adams and Southern, its messengers and agents, and deny them all the facilities heretofore so cheerfully and with so much profit to the railway company accorded to them? Railroads are public institutions, organized to facilitate commerce, and not to force it from its previous legitimate and natural channels. While railroads are necessities for such commerce, express companies have become equal necessities. The latter perform duties which the railways are not legally authorized and therefore not compellable to perform. The collection of packages of value, of money, and negotiable securities, their safe transmission and delivery, the collection and protest of notes and bills, the collection of charges of shippers, are not within the legal duties of railway companies, and are within the daily undertakings of the express companies. Society has become used, therefore, to the instrumentality of the express companies, and if they are deprived of the railway facilities necessary to enable them to perform their duties, the public will be injured, and the railway companies will not be able to render similar service. The suggestion that railway property is private property, to be managed as the railway officials may elect, is more plausible than substantial.

"The railways are as much bound to facilitate the business of the express companies as it is the business of private individuals. The express companies claim a right to the facilities heretofore accorded, to use of the railway passenger trains for the transportation of express matter in the special keeping of an express messenger, who is responsible for the safe delivery thereof. This claim is well founded, has been accorded in the past, and can be enforced by the courts, by their coercive power, in the future. Half a century ago this question could not have arisen. The country has made great progress in both mental and physical development. The railway has been potential in producing the change. The express companies have also assisted largely therein. Indeed, all the money exchanges of the present day are largely effectuated through the express companies, together with the other services rendered by them in connection therewith. Such services the railway companies are not specifically authorized to perform, and if they perform them, it is without legal obligation so to do. If they undertake to perform them, they cannot claim a monopoly therein, nor a right to exclude or suppress the prior agencies, which have for so many years fully met the public demand in that regard. This attempt on the part of the railroad company now to arrogate to themselves an exclusive right to perform those services on behalf of the public, which have so long been satisfactorily performed by the express companies, is not entitled to recognition in a court of equity. The railway companies fostered the business of the express companies, and it was built up and conducted with their assent and assistance, and the railway companies are therefore now estopped from asserting a right to render valueless the business and capital of express companies, or from claiming an exclusive right hereafter to conduct the express business on their own behalf. An injunction will therefore issue, as prayed for by the complainants; and if any question arises as to the proper measure of compensation to be paid by the express companies, such question may be presented to the court; but, in the meantime, the defendant is enjoined from disturbing the business of the express company or from refusing to transmit its express matter under the charge of its messengers."

#### Right of Way—City Street.

In the Indianapolis, Peru & Chicago Company against Rayl and others, the Indiana Supreme Court lately held as follows:

Section 13 of the act of incorporation of the Peru & Indianapolis Railway Company, approved Jan. 19, 1846, authorized such company to locate its road upon a continuous strip of ground of any width in the discretion of the company, not exceeding eighty feet; and under section 15 of that act a general relinquishment of the right of way over a tract of land, without specifying any width, conferred upon the company the right to take and appropriate a strip of ground over the tract specified not exceeding 80 feet in width; that is to appropriate and use an area across such lands of any width, in the discretion of the company, not exceeding 80 feet, the act of incorporation thus forming a part of the contract of relinquishment. And where such relinquish-

ment, supplemented by section 19 of the same act, *supra*, enacting that the right of way, when acquired, should be held by the company in fee simple, purported to convey to the company an estate in fee simple to so much of the land described in it as constituted the right of way through the land under such relinquishment, under such circumstances, whether the grantor had the fee at the time of the relinquishment or not, it makes no difference, where he afterward acquires a fee, for whatever title he acquires subsequent to the relinquishment inures to the benefit of the company. And when in such case the strip relinquished for a right of way runs through a town or city, although it may be used so far as safe as a street, it is still the property of the company, and such company may build a side-track thereon without being liable to an action for damages by adjacent property-holders.

#### Damages for Killing an Employee.

In Roach against the Central Railroad & Banking Co., the Georgia Supreme Court lately held:

1. In a suit by a widow against a railroad company for the homicide of her husband, who was an engineer, in its employment, two things are necessary to a recovery: First, absence of negligence on his part contributing to the occasion or cause of his death; and second, negligence on the part of the company or some other agent or employee. When it is shown that the deceased was without fault, the presumption of negligence on the part of the road arises. It may, however, be rebutted by proof. If neither the company nor the employees were negligent, there can be no recovery.

2. An engineer having jumped from his engine and been killed, and the question being whether or not he was without fault, the necessity for jumping, his ability to jump, and the safety with which he could do so, are all for the consideration of the jury, and it was error for the judge to charge that "the fact that he jumped is proof that he thought jumping the safest course."

3. The court charged as follows: "The pecuniary damages to the wife from the homicide are to be ascertained by inquiring what would be a reasonable support, according to the circumstances in life of the husband as they existed at his death, and as they may be reasonably expected to exist in view of his character, habits, occupation and prospects in life; and when the annual money value of that support has been found, to give as damages, its present worth, according to the expectation of the life of the deceased, as ascertained by the mortality tables of well-established reputation."

Held that, under the facts of this case, the court should have amplified this charge, and the attention of the jury should have been called to the declining years of the deceased and the probable decrease, year by year, of his capacity to labor at his calling.

4. In a suit by the wife of an engineer against a railroad company for his homicide, the jury should consider the age of the deceased, and, if old, his consequent incapacity to labor long.

5. As to the negligence of the engineer of the train immediately preceding that on which the deceased was, it does not depend on his incapacity, by reason of fits or otherwise, to properly handle his train, but on whether, under the facts and circumstances surrounding him at the time of the injury, he was negligent in stopping at the curve.

#### THE SCRAP HEAP.

##### Grievances of Natives on Indian Railroads.

A correspondent of the *Indian Railway Service Gazette* writes as fellows of the grievances which his countrymen suffer when traveling third class on the most important Indian railroad:

"After long time I sending you nother one letter. This time my intention for expose grievances of third-class passengers who got it casion for travel by East India Railway, and I hoping this catching eyes of proper thortities who able for give redress.

"First must making mention of closets on platforms of stations. Now it is rule generally for have three closets; one for native mens, one for native womens, and other one being labelled "Gentlemen." This last is the one I making write about. Now the word *gentleman* is very vague, and therefore every native who consider himself gentleman, thinking he got it right for make use of closet, but it being great mistake; this closet being intended for Europeans only; then why not substituting the word *Europeans* for *Gentlemen*? As case now stands, plenty times native mens making go in *gentleman's* closet, but very soon make turn out by sweeper, who, ever ready in attendance for seeing that all closets put to legitimate use, and generally sweeper making use bad and insulting language—for what better can expect from mens of his class, and it being very shame and disgrace for native gentlemen being treated this kind fashion; but if closet marked *Europeans* then native mens knowing they got it no business there.

"Here I wanting ask one question. How is it that no third-class carriages got it closets in them? Suppose third-class passengers expected for do without attending to calls of nature, but how that can be? Now in every third-class carriage why not make convert one end compartment into closet, with passage leading along one side for purpose of having access to it, and also put water-pipe, etc., same like got it in post-office vans. If agent getting this done, then he receiving the blessing of thousands of poor peoples. Everybody, who making travel by third-class carriage, knowing what inconvenience they put to from want of closet in carriage. How often peoples left behind who going to closets on platforms, because trains not allowed it nough time for this kind of work, and they thinking train halting long time. Now in each station if khallasie who calling out name of station also made call out how long train halting, it being no great bother and it proving great boon to poor people who not afford able travel in higher class carriage than third-class. It is wonder that so many years railway open and no one making think adopt above plan of calling out in every station how long train making halt.

"Nother thing that is real grievance to third-class passengers is this. Many peoples who traveling third class, being afraid for attending to calls of nature in closets on station platforms, through fear of being left behind, and they doing best for refrain from going to closet, and when no longer able refrain then they losing all shame and making use of compartment they traveling in as closet, and all passengers in carriage, which being open right through, getting disgusted and sick from foul smell, which nough for breed sickness. Almost every day this happening, and yet no one making represent matter to proper quarter. If my suggestion adopted, of calling out in every station how long train halting, then this nuisance being greatly reduced.

"Third-class passengers got it nother one very great grievance, which agent cannot knowing of, or he never allow it, *viz.*, making compel passengers travel in coal-wagons, without swept out coal-dust, etc., and other times in iron wagons, and again other times in cattle-trucks. Now, just fancy what state peoples' clothes and body getting in first case, and in second how they suffer from heat, and in third what torture they suffer from sun, wind and very often rain. It not hid from traffic thortities when expect it rush of passengers,

for there being set times for it; then why not making provide third-class carriages for carry passengers, instead of making shove them into wagons and cattle-trucks like herds of cattle? If railway thortities making study comfort of third-class passengers, it being no loss to them, on contrary it being great gain, for here bound to be increase of passenger traffic, and it is fact that third-class passengers keeping up this traffic, and therefore they entitled for receive consideration from railway thortities.

"One thing seeming very strange. How is it that no got it any reserved accommodation for European womens? Every passenger train got it reserved accommodation for native womens, but European womens of no consequence in eyes of railway thortities, they supposed for rough it out best way they can. Why not have it one compartment reserved for them? All leading officers of line are Europeans, and it height of disgrace to them for not attend to wants of their country womens and see that they not suffer indignities when they got it casion for travel by rail."

#### Practical Considerations of Color-Blindness.

There are some practical considerations in regard to color-blindness which have been much commented on of late; indeed, the most modern literature of the subject has been mainly devoted to them. They refer to the competency of color-blind persons to fill certain social positions where the discrimination of colors is of importance. It is evident that persons having this defect must be at a disadvantage not only in the pictorial arts, but in many scientific, industrial and commercial occupations. Yet, it is remarkable how well they have often contrived to get on, in spite of what normal-eyed judges would predict of their incapacity. Chemists, for example, would say it was impossible for a color-blind person to meddle with their science, in which color is one of the most important elements of observation; and yet Dalton somehow made a tolerable name in chemistry. Draftsmen would ridicule the pretensions of a Daltonian to make, or use, or judge of colored drawings, and yet I contrived to do all this for years with tolerable success, without even knowing that there were any serious difficulties in my way. And if one could get at the facts, I am certain we should find abundance of instances in all sorts of occupations where persons similarly affected, but in happy ignorance of their failing, succeed in blundering through their duties without any serious break-down. Such cases as these may be fairly left to the operation of the ordinary laws of business affairs; but the writer on the subject have chiefly busied themselves with one that bears a different character, inasmuch as it directly involves the public safety; this is the possible employment of color-blind persons on railways and in marine service, where colored signals are employed. Most people know that red and green lamps are used at railway junctions, the former to stop a train, the latter to allow it to pass on; and at sea the use of red and green lights on the two sides of a vessel indicates to other ships the way she is going in order to avoid collisions. Now, as one of the most common symptoms of color-blindness is the confounding, under certain circumstances, of red with green, it is taken for granted that a color-blind engine-driver or helmsman must be unable to distinguish between the contradictory signals, and frightful pictures are drawn of the danger that the public are constantly incurring. But what says the inexorable logic of facts? In this country we have not only had a tolerable experience of the working of railways for half a century, but we have gathered a mass of information about railway accidents which is unknown elsewhere. Every casualty that occurs in the three kingdoms is carefully inquired into by a government board, and a report is published as to its causes—and yet, so far as I know, never, in a single instance, since railways have been in use, has an accident been traced to the mistaking of a red for a green night signal. And when we consider that, according to the statistics, about one in every twenty-five engine-drivers must have been color-blind, it follows that, if the notions of the alarmists had been true, numbers of collisions would have occurred every day—in fact, that the traffic of the country could not have gone on. The truth is, the agitation has arisen from the difficulty the normal-eyed investigators have in understanding exactly what we, the color-blind, really see. We could tell them that although the red and green lights do not give us the true red and green sensations, yet still they are strongly contrasted to us, and we are in no danger of mistaking one for the other. The only accident I ever heard of in regard to the color of a signal was a curious one; a driver, when approaching a signal-post, had been looking into a very bright fire, which so effected his vision that for the moment he lost the perception of red; he mistook the red light, not for green, but for white, and, going at full speed through the wrong points, dashed into a train in a siding. On the whole, then, I think the alarm on this subject is unnecessarily magnified; but at the same time I do not deny a possibility of danger under certain circumstances, and I would by no means discourage reasonable precautions in the selection of men. The agitation has at least had some good result, for not only has it induced a wide discussion of the phenomena of the defect, but it has given rise to many ingenious and systematic means of discovering its existence, which, previously, was a difficult manner.—*William Pole, in Contemporary Review.*

#### Preventing Smoke.

A new invention for preventing smoke from coal-burning engines was tried on the Old Colony Railroad, May 27. It is made by the Globe Manufacturing Co., and the Boston *Advertiser* says of the trial: "The locomotive was run at speed, the fireman shoveling coal and closing the door as it passed; the engine with train backed down and stopped; the steam that consumes the smoke was shut off, and the engine ran by, the fireman shoveling in coal and then closing the door, showing a plain engine with the smoke from the stack; the locomotive ran up and stopped as any ordinary engine, showing the smoke, and then stopped it by the steam. All of these experiments were quite successful, and the vast quantity of smoke which rolled out when the fireman—the engine being run as a plain engine—opened the furnace door proved beyond question that a very large percentage of smoke was checked. No cinders were seen. The amount which escaped with the apparatus working seemed as nothing to what was rolled out in heavy clouds when it was cut off. The statement of the Globe Company is as follows: 'This new invention is very simple, easily put on to old or new locomotives. It requires a new stack and saddle, or a modification of the old one, which is connected with a cast-iron chamber, affixed to one, two or three of the lower flues in the boiler. Into the chamber an air-pipe from the outside is attached; from the exhaust base a pipe leads about one-quarter of the waste steam; this is forced into the chamber, and creates a great draft through the air-pipe, and also draws down the hot products of combustion from the stack. The air, steam, sparks and dust are driven with terrific force through and down a peculiar cast-iron shield, mixing the hydrogen, oxygen and nitrogen with the carbon in the fire-box, and the result is almost perfect combustion. The saving in fuel, wood or coal, is fully one-third, as proved by our experiments.' An engine on the road is stated to save 1,000 pounds of coal on every trip between Boston and Wood's Holl."





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## EDITORIAL ANNOUNCEMENTS.

**Addresses.**—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

**Passes.**—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

## GRAIN EXPORTS FROM ATLANTIC PORTS.

As we have often said, the effect of differences in rates to the different Atlantic ports is likely to be felt much more in the exports than in the receipts of those ports, because the differences have no effect on the city consumption and very little, indeed, on the distribution for domestic consumption from those ports. For this reason, when the exports are very small indeed (and it is not very long ago that the exports were but an insignificant portion of the receipts at the East), New York has by far the largest proportion of them, because it and its immediate dependencies have by far the largest population. But when the exports are very large, the natural tendency being to make the total expense, everything considered, the same by way of all ports (for no one will ever export a bushel by any other than the cheapest route, if he knows what the cheapest route is), then Philadelphia and Baltimore are likely to increase the proportions of their receipts to the whole, as well as the absolute quantities. The amount of the differences in rates being a fixed sum, whether the rate is high or low, it may perhaps be that the effect is greater when rates are low than when they are high. With a 10 cent rate from Chicago to New York, the freight charge is 30 per cent. less to Baltimore than to New York; with a 30 cent rate, as now, the charge to Baltimore is but 10 per cent. less, though the same absolute amount. This being the first season that rates have been maintained at remunerative prices during the winter and spring, it will be interesting to observe what the effect has been upon exports. When canal navigation is open, there is a further and a very great change in the circumstances, which when rail rates are well maintained must tell very decidedly in favor of New York; but the canal has been open so short a time this year that it cannot yet have had much effect upon exports though it has had considerable on receipts for about two weeks of the period considered below.

Now the receipts of flour, wheat and corn, which

include nearly all the grain and grain product that is exported on a large scale, from the four leading Eastern Atlantic ports for the 20½ weeks from Jan 1 to May 22 have been as follows for the past two years:

New York:	1880.	1879.	Inc. or Dec.	P. c.
Flour, bbls.	1,283,289	1,592,186	D. 308,897	19.4
Wheat, bush.	17,531,615	16,276,422	I. 1,255,193	7.7
Corn, bush.	13,342,170	11,992,747	I. 1,349,423	11.2
Baltimore:				
Flour, bbls.	185,359	184,797	I. 562	0.3
Wheat, bush.	6,639,593	6,513,117	I. 126,476	1.9
Corn, bush.	8,891,261	12,139,946	D. 3,278,685	27.0
Philadelphia:				
Flour, bbls.	90,846	90,158	I. 688	51.0
Wheat, bush.	2,274,525	4,603,349	D. 2,328,824	50.6
Corn, bush.	7,815,536	7,130,016	I. 685,520	9.6
Boston:				
Flour, bbls.	385,454	226,033	I. 159,421	70.5
Wheat, bush.	1,088,541	1,314,834	I. 373,707	28.4
Corn, bush.	4,511,436	2,924,807	I. 1,586,629	34.3

Reducing flour to grain, the aggregate number of bushels of flour, wheat and corn exported from each port has been:

	1880.	1879.	Inc. or Dec.	P. c.
New York	37,290,230	36,230,069	I. 1,060,161	2.9
Baltimore	16,427,619	19,577,048	D. 3,149,429	16.1
Philadelphia	10,544,291	12,034,155	D. 1,489,864	12.4
Boston	8,127,247	5,369,806	I. 2,757,441	51.3

The four cities..... 72,389,387 73,211,108 D. 821,721 1.1

There has been in the aggregate exports of these four ports a decrease of 5½ per cent. in flour, a decrease of 2 per cent. in wheat, and an increase of 1 per cent. in corn exports. An examination of the above table shows that New York has lost largely while Boston has gained largely, in flour; New York and Boston have gained largely, while Philadelphia has lost very largely and Baltimore has gained a trifle, in wheat; Boston has gained very largely and New York and Philadelphia moderately, while Baltimore has lost largely, in corn. The flour export business is peculiarly a New York and Boston business. Baltimore this year has had but one-tenth of it, and Philadelphia not one twentieth of it.

Taking the aggregate of the three staples, we find that while the total exports of the four ports have been nearly the same this year as last, there has been a gain of more than 50 per cent. at Boston, a gain of nearly 3 per cent. at New York, but the large decrease of 16 per cent. at Baltimore, and one of 12½ per cent. at Philadelphia. In percentages of the total, the four cities have ranked as follows in the two years:

	1880.	1879.
New York	51.6	49.5
Baltimore	22.7	26.8
Philadelphia	14.5	16.4
Boston	11.2	7.3
Total	100.0	100.0

Thus Boston and New York gain in rank as well as quantity, and Boston nearly twice as much as New York. The Grand Trunk has been carrying to Boston from Chicago probably the whole year at a little less than regular rates, and probably Boston's increase is largely due to this. Taking New York and Boston together, and comparing with Philadelphia and Baltimore together, we find that the two northern cities exported 3,817,572 bushels, or 9.2 per cent., more than last year; the two southern ones 4,639,293 bushels, or 14.7 per cent., less than last year, and their percentages of the total were:

	1880.	1879.
New York and Boston	62.8	56.8
Philadelphia and Baltimore	37.2	43.2

—a transfer of 6 per cent. from the southern to the northern ports.

With the maintenance of the present rail rates, New York is likely to have a greater advantage for exports over the other cities than for a long time before, until the coming forward of the new crop forces up water rates materially. Now this may and may not occur. With but a moderate demand abroad and consequent very low prices, it is not likely that high prices will be paid for carriage. The demand will not be pressing, and a large tonnage will not be required to satisfy it. In that case the grain may continue to go forward by lake and canal after as it now does before harvest, until navigation closes, and chiefly by way of New York and Montreal, giving an unusually small business to Philadelphia and Baltimore; but in that case the New York railroads will profit little more than any others from the heavy New York business. Should, however, the foreign demand cause a very active movement after harvest, as it has done for three years past (but is much less likely to do this year), then water rates will doubtless be forced up and a heavy traffic will be turned upon the railroads at current rates or more, and the cities which receive exclusively by rail will get the large export business in the fall as well as in the winter which they have enjoyed for several years past. One thing is quite certain. New York merchants will have much less reason to complain of a diversion of the grain export trade to Philadelphia and Baltimore if rail rates are maintained much above lake and canal rates while navigation is open than if the rail rates are put substantially on a level with water rates, as they have

been so much of the time for the four seasons past. The southern cities will then be limited largely to a business in winter or in those seasons when a great pressure of traffic forces up lake and canal rates above the level of profitable rail rates. Now, although the water rates have been so advanced after harvest for three years past, it is not probable that it will often be so hereafter, for the reason that the exceptionally large profits will cause the provision of a larger stock of vessels, as is the case this very year. Indeed, were it not for the rail connections of Baltimore and Philadelphia with Buffalo and Erie, it is doubtful if the former cities could maintain any considerable export grain business, while lake navigation is open, hereafter. But the competition which they have to meet is that of the canal alone, not that of the lakes, which can be made to serve them as well as New York. Now canal transportation is very much more costly than lake transportation. When rail competition was severest, it was contended that the large propellers with barges did not lose money, and sometimes made a little, at 1½ cents a bushel, for the 525 miles of rail distance (925 of lake distance) from Chicago to Buffalo; but it was universally the opinion that the canal boats were losing at 4 cents a bushel for the 425 miles of rail distance (500 of canal and river) from Buffalo to New York; and that the canal even now feels the competition of the railroads much more than the lakes, is seen by the fact that while lake rates are now 175 per cent. higher than at this time last year, canal rates are but 50 per cent. higher.

If Baltimore and Philadelphia then get but a small proportion of the grain in the summer, there will probably be less objection from the merchants to their getting a pretty large proportion in the winter. This argument, however, will not affect the railroad interests. What the New York railroads want is that they should have the largest possible proportion of the grain traffic. If neither they nor the other roads can get it at remunerative rates in the summer, and consequently it pretty much all goes by canal to New York, by the St. Lawrence to Montreal, or by the Mississippi to New Orleans from April till December, that will be of very little advantage to the New York railroads. In that case they will have much greater interest than the New York merchants themselves in preventing too great a difference between the rates to New York and those to Philadelphia and Baltimore.

This suggests that a further effect of the maintenance of rail rates at remunerative figures is likely to be in the long run a diminution of the winter business. Latterly, until last winter, rates have not been very much higher in winter than in summer, and there has consequently been comparatively little disposition to hurry grain forward before navigation closed in the fall, or hold it till the lakes open in the spring. For three years past there has been an enormous winter business. Now when it becomes known that the railroads will not hereafter carry grain through winter for the bare cost or less, we must expect to see merchants do as they used to do, namely, get as much grain as possible to the seaboard before navigation closes. So far as the consuming public in general is concerned, it is a matter of indifference where the grain is stored. It should be remembered that the whole stock must be stored somewhere from the time that it is harvested until it is required for consumption, and it may just as well be in Liverpool, Havre or New York as in Chicago, Milwaukee or the farmers' granaries. Indeed, considering the lower rates of interest abroad, it would seem natural that the stock required for foreign consumption should be held abroad from the earliest date at which it is possible to obtain it. As exports go on all winter, to utilize the ocean grain fleet as far as possible they should be made in pretty uniform quantities (in connection with other freights) from week to week.

But the railroads cannot afford to have the grain movement cease in winter, so long as they can get anything more than cost for carrying. They are, it is true, assured a pretty large traffic for domestic consumption, at rates which often may be considerably higher than those which export grain will bear; but they are not at all likely to give up carrying for export. If we assume the present 30-cent rate to be the lowest at which they think it worth their while to carry in the summer, we may be sure that they will carry for that in the winter also if they cannot get grain at a higher rate. And the tendency of a settled system, in which freight will never be taken at unremunerative rates, will be, we think, toward the approximation of summer and winter rates—not their equalization, but their approximation. If there is, as a settled policy, a very much higher rate in winter than in summer, then the grain trade will adjust itself to this policy by shipping for export and consumption in the seaboard cities almost



entirely while navigation is open; the reflex effect of this will be to bring down rail rates to such figures as will attract winter shipments. Under favorable circumstances these may be comparatively high, it is true, but on the average not very much higher (for export grain) than those at which the grain is carried in summer, which will themselves be limited by the lake and canal rates. It will not at all be strange, should the price of grain be very low next winter, if the railroads should carry even at the rate of 30 cents per 100 lbs. which they declare to be the least they are willing to accept this summer.

#### INDUSTRIAL CONCILIATION.

It may be predicted, with absolute certainty of fulfillment, that the perplexities involved in what is called the "labor question" will, in the future, present themselves to railroad managers, as they have in the past, and that those who wield and those who are subject to authority will have occasion to consider and take action on some of the most delicate and dangerous relations existing in modern society. It would therefore seem to be wise to give some consideration to these relations at a time when, at least among railroad men, there is no special heat or excitement concerning them, and when it is therefore possible to regard the whole subject with more calmness than it would if two parties were arrayed in a belligerent attitude toward each other, as they usually are after a strike occurs.

A disinterested person who will study this question carefully will be struck with the singular misapprehensions into which both of the two parties concerned in it often fall, and no better work could be done than to write some plain exposition of the fallacies involved in some of these opinions. Thus the idea is very common among employes, that high or low wages are dependent simply on the inclination of their employers, and most of the former are quite unconscious of the fact that there is any law of supply and demand which those who pay wages must observe.

On the other hand, with the latter, more especially those who hold authority not by virtue of the accumulation of capital, but by an appointment from those who have gained both money and experience in that way, the error is very common that strikes and discontent among laborers is due to some kind of fortuitous causes or the influence of "agitation," instead of being the product of vast forces inherent in the constitution of society, and which have acted, and will continue to act, through long periods of time. To quote from a writer on this subject, of whom we will have more to say: "The explanation of such stupendous facts by the work of agitators is exactly similar to the primitive belief of savages, who attribute the occurrence of eclipses and the appearance of comets to the manipulations of a juggler or a sorcerer." It is very true that strikes are very often incited by the influence of agitators, but they would be powerless to do so repeatedly, were it not for the underlying causes which are as old as civilization and apparently as indestructible as human selfishness and injustice. It is idle and foolish to think and talk about crushing out trades-unions and strikes. Those who have studied the subject carefully see this plainly, and when an arrogant official proclaims that he will not "recognize" a trades-union but will crush it out, he is unwittingly making a display of his ignorance of the whole subject. The independence of workingmen, their resistance to arbitrary power both political and industrial, is the great fact which underlies the labor question and is inevitable. This independence may be controlled and directed into right channels, but cannot be taken away, and the sooner this fact is realized the better it will be.

The notion, too, that trades-unions cannot be a help and advantage to workingmen is also fallacious. It is true that, owing to the unwise manner in which they are often conducted, they do more harm than good, and do injury to both workmen and employer; but on this subject so disinterested and able an authority as Professor Fawcett, in his "Manual of Political Economy," says:

"When men labor simply for hire, it is manifest that the adjustment of wages is analogous to the bargaining which is carried on by the buyer and seller of a commodity. Although it is no doubt true, that the price at which a commodity is sold approximates to the cost at which it can be produced and brought to market, yet the price at which it is actually sold is often to a considerable extent influenced by various circumstances, which may happen to place the buyer in either a better or worse position for bargaining than the seller. In a similar way, wages ultimately depend upon the amount of capital and upon the number of laborers; yet the wages which at any time are paid in a certain trade are to a considerable extent influenced by the relative advantages possessed by employers and employed for carrying on the bargaining, by which wages are adjusted. The question, therefore, arises: Will workmen, by combining,

or by showing that they have the power to combine, improve their position in carrying on this bargain. \* \* \*

"It therefore appears that the bargaining which often goes on in adjusting wages implies a struggle, or a conflict of effort between employers and employed; in this conflict a great advantage will be possessed by those who can act in concert over those who simply act as isolated individuals."

If an employer has made an agreement or come to an "understanding" with others of his own class as to the wages to be paid, he is at once placed in an advantageous position to resist the demands of his employes, if they have no organization for combined action. If this advantage exists from co-operation, it is manifestly unjust to demand its surrender on the part of the workmen alone. Making it one of the conditions of conciliation, as is sometimes done in case of a contest, is like sending a flag of truce to a belligerent, and requiring as one of the terms of peace that your opponents shall lay down their arms. So well is this understood in all contests for wages, that it is one of the first things demanded and the last surrendered. In fact, it now appears to be the most vital question in dispute. It is the one which the men cling to the most tenaciously, and that which employers are the most earnest to have given up. As remarked before, the complete independence of the workmen is inevitable, and it is folly to suppose that this can be maintained if the very source of their strength is paralyzed or if they are deprived of co-operation in their common purposes. It is of course true that combinations of workmen have been temporarily broken up, but almost invariably they re-organize with greater strength than before. This has been illustrated again and again, both here and in Europe. In 1852 the "Engineers" (machinist and allied trades) were "locked out" in England. The lock-out began with an ultimatum or declaration of war on the union, and the employers entered upon the contest with the formidable announcement that they would utterly destroy it. To borrow again the language of the writer first quoted from:

"Refusing all offers of compromise, the employers would only accept the complete and abject submission of the men. They had to choose between starvation or desertion of the Union. They were forced to break faith with their Union; and in the end they broke their promise and not their faith. It was a fierce and ungenerous triumph by the employers, but a fruitless victory, as far as the destruction of the Union was concerned. For the Society of Amalgamated Engineers, instead of being destroyed, acquired fresh strength and has prospered ever since; proving that the power of combination can withstand the most crushing defeat."

This history was almost exactly repeated in this country. About the year 1864 or 1865 a strike of the Brotherhood of the Foot-board occurred here. The same arrogant announcements were made and carried out, but only to be followed by the reorganization of the old union, and with greater strength than ever. It would not be difficult to find other examples to illustrate this truth. It is hopeless to attempt to crush out trades-unions. It may be done temporarily, but they will revive again with still greater strength. So long as the existing industrial relations exist, it is found that the attending evils will be diminished and not increased by organization of both employers and employed. They make it possible to adopt civilized methods in settling industrial disputes. As Professor Fawcett remarks: "Strikes are inseparable from our present economic system. Because as long as wages are settled in the same way as a bargain, it must often happen that one party will refuse to accept the price offered by the other."

But, some reader will say there is no objection to this. A strike of that kind is perfectly harmless. If men don't choose to work for the wages offered, they need not, but they must not prevent others from doing so. To this all will agree; but it may be said if one man may refuse, ten men, a hundred or a thousand, may do so. Here dissent from the general principle usually begins. What is right for one man is often regarded as questionable for ten, as objectionable for a hundred, wrong in a thousand, and criminal in ten thousand. Whether they reason in that way or not, employers sometimes refuse to engage men who are members of a union or association which makes it possible for large numbers of them to agree to refuse a given rate of wages, and in that alone consists the power and influence of trades-unions to influence wages, excepting in ways which are unjust and illegal. Is it a wonder, then, that the men surrender this privilege with great reluctance, that they will often encounter a strike with all its privations and sacrifices, its doubtful issue and risk of losing employment altogether? It must be remembered, too, that when the workman surrenders the right of membership which he believes to be for his own protection, his employer does not give up the privilege which he can always exercise, secretly if he chooses, to form a compact with his associates or as many of his class as he chooses. It is for these reasons that the demand by employers that

those in their employ shall surrender their membership in trades-unions and other similar associations is an injustice and is certain ultimately to work much more evil than good. If the views of some arbitrary officers of railroads could be carried out, it would be made impossible for any man who is a member of a trades-union to secure employment in what is probably the only occupation of which he has any knowledge. Let this be the case, and secret associations are as certain to be organized as they are under the tyranny of Russia.

For these reasons, it is believed that the most important step to be taken in dealing with, or, rather preventing, strikes in this country is the cordial recognition on the part of railroad officials of the trades-unions of their employes, and the establishment of amicable, instead of hostile, relations between those in authority and these associations. Professor Fawcett says of strikes: "It is hopeless to expect that legislation can prevent them. Something may no doubt be done by conciliation and arbitration, either to obviate, or to render less frequent, the trade disputes arising between employers and employed." "Such expedients," he says "although exerting a most useful influence do not provide a completely efficient remedy for strikes." Although the latter, unfortunately, is true, yet there can be no question that a system of industrial conciliation has in many cases in Europe been very effective in preventing disputes between employers and employed from resulting in strikes. The time to prevent the latter is before they occur. After war is declared neither party is ready to listen to conciliation. It is because the system of boards of arbitration and conciliation in use in Europe is so little known in this country that this article has been written, so as to call the attention of the railroad officers and those under them to it in advance of future industrial contests, or rather of indicating how they may become acquainted with it, by calling attention to a little book on the subject, which is almost unknown in this country, and to which the attention of the writer was called by Mr. Thomas Hughes, the author of "Tom Brown at Rugby," at the time or soon after the railroad riots of 1877. This book has the same title as this article, "Industrial Conciliation," by Mr. Henry Crompton.\*

The general discussion of the labor question which followed the railroad strikes and riots of 1877, made most persons familiar with the methods of arbitration for deciding disputes between employers and employed. But arbitration is resorted to only after a dispute or strike has occurred. Conciliation aims at the prevention of such disputes, and not alone at their cure. Its purpose is like that of the intercourse of the ambassadors of different nations whose office it is to maintain amicable relations between the nations they represent. Arbitration is only resorted to by nations, and by workingmen and their employers, after a dispute has occurred or hostilities have commenced. Disputes between nations can be easiest avoided by the friendly intercourse of their representatives, and in the same way the differences and claims which arise in industrial relations can be adjusted much easier before they assume the character of disputes. For these reasons and because the relations between employers and employed had been so very unsatisfactory, in the year 1860 Mr. Mundella and some other English manufacturers resolved to try some other alternative. It may be said here that the early history of strikes in England has in part repeated itself in this country. They were there attended with terrible riots, murders and arson, and Mr. Crompton tells us that in 1860 these had disappeared, but "there was still hatred and suspicion by the operatives toward their masters, who in their turn entertained feelings of animosity against the men," and Mr. Mundella admitted that, "in times of depression a manufacturer pressed down the workmen as low as he possibly could, and when the time for an advance came, it was always resisted as much as possible. The men sent deputations from trades-unions around to the warehouses. At one they would be told that the masters would not acknowledge trades-unions. At another they would be told to 'wait till we see what our neighbors do.' After being received in that way the chances are that the men would strike, and perhaps ask for more than the trade could fairly give."

In 1860 there were three strikes in the branch of trade in which Mr. Mundella was engaged. He and some others determined to try some other alternative than that of a strike for settling the dispute, which was one of wages. A hand-bill was

\* Henry S. King & Co., publishers, London. As it was impossible to get this book in this country, a few have been imported and are for sale at the office of the Railroad Gazette.



issued, inviting a conference between master and men to see if a peaceable issue might not be reached. "Three of us," says Mr. Mundella, "met a dozen leaders of the trades-unions. We consulted with these men and told them that the present plan was a bad one, that they took every advantage of us when we had a demand, and we took every advantage of them when trade was bad, and it was a system mutually predatory. Well, the men were very suspicious at first; indeed, it is impossible to describe to you how suspiciously we looked at each other. Some of the manufacturers also deprecated our proceedings, and said that we were degrading them."

It was finally agreed to establish a board of arbitration and conciliation, and to refer all questions in dispute to the board; that it should be composed of an equal number of manufacturers and workmen, both to be chosen annually by their respective bodies, the chairman to be elected by the meeting, and have a casting vote, if necessary.

This first experiment illustrates the whole principle of industrial conciliation. It is simply a board consisting of an equal number of representatives from each side, which sits and hears complaints and agrees upon a remedy, if this is possible, and if not, agrees to refer the questions in dispute to arbitration and to abide by such decision. For the details of the working of the system we must refer to Mr. Crompton's book. He says of this method of settling disputes that, "The board in fact accepts the trade-union and the principle of combination among employers and employed, and uses it as the instrument for establishing peace and good will, liberty and justice. With the workmen there would be great difficulty if there were no trades-unions. There is no way of binding the men to accept the decision of the board, unless there are unions, or some other organization among them that would have the same power over them."

No doubt such opinions will grate harshly on the ears of some railroad officers whose ideas of justice and independence are more suitable to the latitude and longitude of St. Petersburg than they are in a republic and among a people who cherish traditions of liberty. The question, though, is not whether such views coincide with the preconceived notions of our readers, but it is whether the system of conciliation is a wise one to adopt in dealing with working men. The length to which the latter may go, and the excesses of which they may be guilty, was illustrated in the riots of 1877, and still later in the history of California, and there is no reason for thinking that the conduct of men engaged in strikes here will be more temperate than that of British workmen was in the past in their own country. All who have studied the subject are agreed that unless they are averted by some system of conciliation, under the present industrial relations strikes are inevitable. If this is so, what is the wisest course to pursue—to fight it out until one side or the other is exhausted, or to come together in a rational way and "reason together," on the common ground of independence and justice?

To those disposed to study the question more fully, the book of Mr. Crompton is recommended.

It is a small one, and gives a general statement of the principles and practice of conciliation and arbitration under the following heads, "The Industrial Situation, Arbitration, Conciliation, The Manufactured Iron Trade, The Coal Trade, Arbitration in other Industries, The Law of Arbitration, Conclusion," and an appendix containing rules adopted for the government of such boards as are described, and also the British law relating to arbitration. A few hours' time will suffice to read the whole of it, and if every railroad president, manager and superintendent could be induced to read it, its effect could hardly be otherwise than salutary, and it is believed it would be sure to aid them in averting strikes in the future.

As this article has already reached the limits of the space which can be devoted to it, there is room only for the following extract from Mr. Crompton's book in confirmation of the views expressed above. It should be kept in mind, too, that he has had abundant opportunity of getting experience in the practical working of the system of which he is so ardent an advocate. He says:

"The practical success which has attended the establishment of most of the boards of arbitration and conciliation is due to the fact that the employers have really accepted the independence of the men—that is, they have accepted the trades-unions, which the men rightly regard as the secret of their strength."

"We have come to the conclusion that permanent boards, either of arbitration or conciliation, are not possible unless the operatives are united together in some form of permanently established organization, without which there is no guarantee that the men will abide by the decision of the board; and that the system has the best chance of success when the employers are also associated together."

[\* The italics are ours.—EDITOR RAILROAD GAZETTE.]

#### RAILROAD EARNINGS IN APRIL.

In our monthly table, published this week, we give reports for April from the extraordinary number of 56 railroads, which had in the aggregate 31,399 miles of road this year, or about 26 per cent. of the total mileage in operation in the United States. These roads, having 11.4 per cent. more road than last year, earned 27.3 per cent. more money, and their average earnings per mile of road increased from \$567 to \$648, or 14.3 per cent. Of the 56 roads, there are only three that show any decrease in total earnings (small in every case except that of the Toledo, Peoria & Warsaw), and but eight that have a decrease in earnings per mile of road, though just one half of them have some increase in mileage, and several have a very large increase, and chiefly of road with thin traffic. Some of the increases are enormous, as 442 per cent. on the Denver, South Park & Pacific (with an increase of 73 per cent. in mileage); and such increases in earnings per mile as 88 per cent. on the Wisconsin Valley, 71 per cent. on the Missouri, Kansas & Texas, 66 per cent. on the Texas & Pacific, 50½ per cent. on the St. Louis, Alton & Terre Haute main line; 50 on the Northern Pacific, 47 on the Houston & Texas Central, 63 on the Cairo & St. Louis, etc.

In the list are seven roads a large part of whose traffic is through freight between the East and the West, carried at trunk-line rates. Last year these rates on east-bound freight were very badly demoralized, but traffic was very heavy and navigation was closed except for the four last days of the month; this year the rates were well maintained on the basis of 35 cents per 100 lbs. on grain from Chicago to New York for the first 13 days of the month, and at 30 cents during the rest of it, but lake navigation was open after the 2d, and canal navigation after the 19th (the latter was not open at all in April of last year). All the seven roads in question except one, the Toledo, Peoria & Warsaw, show an increase of earnings in the month, and the aggregate earnings of the seven increased from \$6,163,010 to \$7,735,489, or 25.3 per cent. The greatest proportionate gain among these roads is 50½ per cent., on the main line of the St. Louis, Alton & Terre Haute; the Indiana, Bloomington & Western's increase is so small that it may be considered to have stood still. The Warsaw's decrease may be charged to the fact that its earnings were extraordinarily large in April last year. After the opening of navigation, however, the roads that lead to the lakes have had an advantage this year over those which can be used only for through rail shipments, and there are some indications of this in the earnings of the two years.

The roads are this time pretty well scattered over the country, at least to such an extent that the aggregate result may reasonably be supposed to represent the average condition of railroad business in the country. Only one New England road reports, however, but there are twelve Southern roads with 4,973 miles of road. The Pennsylvania, the New York Central and the Northern Central reflect very well the activity of traffic in the Middle States.

The table below gives the earnings per mile in April of thirty different roads for the past seven years, or as many of them as the information could be obtained, which will enable us to compare this year's earnings not only with those of last year, but also with those of other years.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Atch., Top. & S. P.	\$224	\$219	\$280	\$282	\$381	\$587	\$525
Burl. C. R. & Nor.	211	220	320	197	272	231	288
Cairo & St. Louis.	130	171	116	133	131	133	216
Central Pacific	881	1,057	1,085	867	740	645	566
Chicago & Alton.	591	596	560	501	496	495	640
Chi., Mil. & St. Paul.	600	457	405	367	555	385	350
Chi. & N. W.	.....	.....	.....	435	604	523	558
Cleve., Col., Cin. & Ind.	748	645	630	620	566	575	731
Cleve., Mt. V. & Del.	.....	.....	192	201	207	200	227
Eastern	.....	.....	.....	738	669	683	877
Flint & P. Marquette	415	.....	.....	.....	.....	365	443
Georgia	491	417	398	303	260	228	264
Hannl. & St. Jo.	540	498	460	623	468	532	685
Ill. Cen. in Ill.	663	661	569	465	476	443	489
Ill. Cen. in Iowa.	592	360	318	253	316	284	293
Int. & Gt. North.	173	188	173	154	154	156	198
Louisv. & Nash.	356	321	350	302	392	407	498
Mem. Pad. & N.	.....	.....	148	107	123	104	155
Mo. Kan. & Tex.	273	245	273	262	263	241	411
Mobile & Ohio	250	208	201	184	219	232	271
Northern Central	1,098	1,182	1,099	1,008	848	1,009	1,184
Paducah & Eliz.	.....	.....	.....	138	124	129	192
Pennsylvania	.....	.....	.....	1,306	1,461	1,553	1,929
St. L. A. & T. H.	.....	.....	.....	.....	.....	.....	.....
Bellville Line	578	570	537	515	511	582	648
St. L. L. Mt. & So.	336	402	400	420	413	465	589
Scioto Valley	.....	.....	.....	.....	308	213	205
St. P. & Duluth	.....	.....	.....	.....	212	164	224
Texas & Pacific	.....	.....	258	262	300	301	234
Tol. P. & Warsaw	389	311	498	380	382	474	389
Wab., St. L. & P.	.....	.....	.....	536	541	501	571

It will be seen by this that in some cases the great improvement this year was due to the fact that earnings were not good last year. Only five out of 30 roads have smaller earnings per mile this year than in 1879, but 14 out of 29 had smaller earnings in 1879 than in 1878. Comparing with the earnings per mile this year, five out of 30 had larger ones in 1879, five

out of 29 larger ones in 1878, three out of 27 larger ones in 1877, seven out of 22 larger ones in 1876, five out of 20 larger ones in 1875, and six out of 20 larger ones in 1874. This year, therefore, shows very favorably in comparison with any other. And no less than 20 of the 30 roads had larger earnings this year than in any preceeding year here reported, while only three have smaller earnings this year than in any preceding, and of these two (the Central Pacific and the Chicago, Milwaukee & St. Paul) have had their earnings per mile decreased by a great increase of new road with thin traffic.

For the four months ending with April our table has returns from 55 railroads, with 31,231 miles of railroad. With 9.1 per cent. more road than last year these have earned in the aggregate 26.4 per cent. more money, the amount of the increase being no less than \$17,134,474, and the increase per mile of road has been from \$2,264 to \$2,625, or 16 per cent.—a very great improvement indeed. In the whole list of 55 roads there is not one whose total earnings are not greater than last year, and only three (the Atchison, Topeka & Santa Fe, the International & Great Northern, and the St. Paul & Sioux City) that have any decrease in earnings per mile even. No less than 27 of the whole number show an increase of 25 per cent. or more in earnings per mile, while in fifteen cases this increase is more than 40 per cent., and in seven cases more than 50 per cent. The four months thus make a better showing than April, and as it is for the most part the same roads that report for April and the four months, this indicates that the improvement was less in April than in the preceding months of this year.

The effect of the opening of navigation will be felt more hereafter than in April. It is a great advantage to many roads, probably to the larger number of those that report. Moreover, May and the following month will compare with a period when navigation was open last year as well as this.

#### Chicago Shipments Eastward.

The shipments of freights of all kinds from Chicago to the Eastern ports by the roads forming part of the east-bound pool (all but the Chicago & Grand Trunk), since the making of 30-cent. rate on grain April 14, have been as follows, each week:

4 days to April 17	28,017 tons.
Week to " 24	37,322 "
" " 1	30,263 "
" " 8	27,000 "
" " 15	24,485 "
" " 22	29,067 "
" " 29	27,136 "

This is an average of 30,522 tons per week. During the year past the average weekly shipments from Chicago by these roads has been about 41,500 tons. For a few months the Chicago & Grand Trunk has been working actively for shipments, and, it is generally understood, at a little less than the regular rates. The shipments from this road have not been officially reported, but the Grand Trunk people have intimated that they were something like 5,000 tons a week on the average recently, which is not much less than the average of the five roads in the pool (that is, 6,100 tons a week since the April 14 tariff took effect). If this is so, the average weekly shipments under this tariff have been 35,500 tons, and only 6,000 less than the average of the whole year. But the period after navigation opens and until after harvest is always one of very light rail traffic, whenever grain is carried for more than cost; and there is nothing remarkable in the rail traffic being comparatively light now. It could be made heavy only by taking grain from the lake vessels, and this would immediately result in such a reduction of lake rates that the railroads would have to carry for less than cost in order to keep the grain from going back to the vessels. As it is, lake rates are well maintained, and the railroads get 30 cents per 100 lbs. on a very considerable grain traffic—last week 16,713 tons out of 27,126 tons of freight of all kinds. To make the same profits at 20 cents per 100 lbs., the shipments would have to be trebled or quadrupled, which would leave half the grain fleet without cargoes.

There is, however, absolutely no disposition among the railroads to reduce the grain rate, so far as we can learn. The trunk lines which suffer most from the maintenance of rail rates much above water rates are the Baltimore & Ohio and the Pennsylvania, and both these companies have been strongly opposed to reducing the rate. The effect of so much idle rolling stock, however, is to lead agents to make efforts to secure shipments for their roads by circuitous methods, and they have lately been very ingenious in inventing methods for attracting shipments by new devices, which were sometimes not easily detected. Doubtless slight advantages to shippers have been given by some of these devices, but there has not been enough to make very great changes in the shipments by the different routes, nor to induce competing roads to reduce rates to meet these irregularities. The great bulk of the traffic has been carried at full regular rates, and whatever inducements have been given to shippers by underhand practices—such as billing from points whence the rate is lower in proportion than from the point whence the freight is really shipped—have made very little difference in the aggregate freight receipts, though they have made some trouble, as all irregularities do, however slight their effect.



The tendency now is for places south of the lake ports to make special efforts to prevent traffic from going northward to the lakes, and to secure its shipment directly eastward; but though some of the roads from these places get no traffic when it goes by the lakes, yet nearly all of them have advocated the maintenance of the present tariff. Indeed, the railroads seem to be quite unanimous in the opinion that a big business is not so much a desideratum as a profitable business, and a grain traffic of 1,000,000 bushels weekly yielding a profit of five or six cents a bushel is looked on complacently, because the fact is appreciated that the rates necessary to secure two or three millions of bushels weekly would leave no profit at all.

#### Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

*Jerome Park.*—Completed from the junction with the New York & Harlem road to Jerome Park, N. Y., 1 mile.

*Northern Pacific.*—The *Missouri Division* is extended westward to Knife River, Dak., 16 miles.

This is a total of 17 miles of new railroad, making 1,519 miles thus far this year, against 619 miles reported at the same time in 1879, 407 miles in 1878, and 461 miles in 1877.

THE RECENT FALL IN RAILROAD STOCKS is exhibited very completely by a table in the *Commercial and Financial Chronicle*, which we copy on another page. The total amount of the decline made May 25 from the highest prices of the present year on those stocks only which are admitted to the New York Stock Exchange was thus more than two hundred millions of dollars, and 18 per cent. on their face value, and very much more on their highest market value. The percentage of the decrease in some cases is very great—as 50 per cent. in Central of New Jersey stock, 37½ in Burlington, Cedar Rapids & Northern, 40 in Chesapeake & Ohio, 52 in Chicago, St. Louis & New Orleans, 60 in Columbus, Chicago & Indiana Central, 46 in Hannibal & St. Joseph common, 45 in Lake Erie & Western, 43 in Missouri, Kansas & Texas, 55 in Mobile & Ohio, 56 in Manhattan Elevated, 66 in Marietta & Cincinnati first preferred, 44 in Northern Pacific common, 53 in Nashville, Chattanooga & St. Louis, 49 in Ohio & Mississippi common, 74 in Philadelphia & Reading common, 48 in St. Louis, Iron Mountain & Southern, and 45 in Wabash common. Of course the large decreases are in non-dividend-paying stocks; but the fall in sound dividend-paying concerns has been very considerable also, so that the difference between the highest price and that on May 25 is in almost every case (except of guaranteed stocks) more than a year's dividend, and in some cases equal to two or three years' dividends. The most remarkable thing in connection with this fall in prices is that it should come just as the reports of earnings showed that the railroads generally were doing extraordinarily well, and in many cases much better than ever before. But before we conclude that this great fall in prices is altogether unprecedented and senseless, we will do well to go back a few months further, when we will find that the rise which preceded this fall was greater, more rapid and more universal than the fall has been, and that the very low prices of to-day would in a majority of cases have been esteemed very high prices a year ago. It is, however, remarkable that people who had convinced themselves last winter that a stock was worth 50 should be so ready to let it go now at 30, when all the conditions of prosperity are quite as favorable as they were then. The explanation is, doubtless, that buyers at the high prices were not convinced of the value of what they bought then, but were convinced that "things were booming," and that the current toward higher prices was such that they would be able to sell out at a profit. The number of purchases purely for investment were doubtless comparatively few, many who bought and paid for their stocks and who depend upon them for an income, buying at the high prices only because they thought they would go still higher.

THE PENNSYLVANIA RAILROAD COMPANY, on the first of June last, came under the administration of its new President, Mr. George B. Roberts, and Mr. A. J. Cassatt was promoted to be First Vice-President, both being promotions of men who have long been in training for these high administrative duties, just as army officers are. It is noticeable (and encouraging for the railroad man's calling) that these two first officers of one of the most important railroads in the world are filled by men who have been trained from their youth up to railroad business, and have never had any other profession; men who were educated as engineers and have earned their advancement by services in their profession. A sketch of Mr. Roberts' career was given at the time of Col. Scott's resignation. His work, before becoming Vice-President, had been more in railroad construction and maintenance than in railroad operation. Mr. Cassatt has had the various training in different departments of railroad business which the Pennsylvania Railroad Company is accustomed to give the very promising men in its service whom it designs for high positions. A graduate of the Troy Polytechnic Institute (like a great many men on the Pennsylvania Railroad), after serving in various positions where the practice was chiefly that of a civil engineer, he was made Superintendent of Machinery, in which position he had opportunity to become familiar with the fundamentally important but much neglected rolling-stock department. When Dr. E. H. Williams left the superintendency of the road to become a partner in the Baldwin Locomotive Works, Mr. Cassatt succeeded him as General Superintendent, and then was made General Manager and Vice-President in due course. It will be noticed that

this system of the Pennsylvania Railroad Company, by which promising young men are picked out and trained in different departments with a view to giving them the varied knowledge which will qualify them for positions where they will have the oversight of many or all departments, not only secures the company thoroughly qualified chief officers, but in a manner perpetuates its administration and makes it continuous. With Colonel Scott gone there is no revolution in the administration; it is the same administration with another head, but a head which has for many years had a responsible part in the administration, and which is familiar, and long has been, with all its duties.

LAKE AND CANAL RATES have advanced during the past week. Lake rates remained the same until after Sunday (5½ for corn and 6 for wheat from Chicago to Buffalo), but Wednesday they were reported about half a cent higher. Canal rates, which the week before were 5 and 5½ cents until Wednesday, and then, as we announced last week, were advanced half a cent, went up half a cent more in a day or two, and thereafter stood at 6 cents a bushel for corn and 6½ for wheat from Buffalo to New York. At these current rates it costs about 13½ cents to have a bushel of corn carried from Chicago to New York, against 16.8 cents by rail, and with the difference no greater than this, a very satisfactory rail movement may be expected.

Ocean rates, which after standing at 4½ d. and 5d. per bushel from New York to Liverpool by steam for some weeks had fallen to 4d. by Wednesday of last week, in a day or two fell a penny more, and for some days have stood at 3d., which is about as low as the rates have ever been. The difference between lake and ocean rates is very striking. It now costs as much to ship grain 925 miles on the lakes as three times that distance on the ocean, while usually the ocean rate is much the highest. Compared with the rates prevailing at this time last year, the changes are, per bushel of corn:

An advance by lake from 2 to 6 cents.

An advance by canal from 4 to 6 cents.

A reduction by ocean from 10 to 6 cents.

Last year it cost (omitting New York transfer charges) about 16½ cents a bushel, to move corn from Chicago to Liverpool; this year the cost is 19½ cents. The lake vessels get 200 per cent. more, the Buffalo elevators nearly 200 per cent. more, the canal boats 50 per cent. more, but the ocean steamers 40 per cent. less than they got last year at this time. Then, too, the railroads were carrying great quantities of grain at 10 and 12½ cents per 100 lbs., which was fully as low as the lake and canal rate.

A GRAIN ELEVATOR AT SAVANNAH is to be built, and this seems to be the first serious step toward establishing the much-talked-of grain export trade from Southern ports. The first step was taken last week by the purchase from the city of Savannah by the Ocean Steamship Company of Savannah (represented by Colonel Wadley, President of the Central Railroad of Georgia), of a piece of river front under engagement to erect thereon a grain elevator with a capacity of 100,000 bushels. The building is to be completed about the 1st of September. It will not be necessary to go to the Northwest to get grain for it; when the wheat crop is as good as it was last year, a very considerable amount has been shipped from Nashville via Louisville to New York, which is nearly times as far as from Nashville to Savannah.

THE DANUBE STEAMBOAT COMPANY is probably the greatest corporation in the world conducting transportation on rivers. At the close of 1878 it had 165 side-wheel steamboats with an aggregate of 15,919 horse-power, 18 propellers with 620 horse-power, and 12 other steam craft (including a floating elevator), and 770 craft that are towed. A large part of the navigation is by a wire laid in the stream. This company operates on the Danube and its tributaries; the vessels of all competing enterprises number but 89 steamers and 358 tows.

## General Railroad News.

### MEETINGS AND ANNOUNCEMENTS.

#### Annual Conventions.

Meetings of various railroad and engineering associations will be held as follows:

The *Master Car-Builders' Association* will hold its fourteenth annual convention in Detroit, Mich., beginning Tuesday, June 8.

The *Yard-Masters' Mutual Benefit Association*, of the United States and Canada, will hold the sixth annual convention at the Revere House, Boston, Mass., beginning June 9 next.

#### Dividends.

Dividends have been declared as follows:

*Chicago, Burlington & Quincy*, 2 per cent., quarterly, payable June 15.

*Eastern, in New Hampshire* (leased to Eastern Company), 2½ per cent., semi-annual, payable June 15.

*Iowa Falls & Sioux City* (leased to Illinois Central), 1 per cent., quarterly, payable June 1.

*Central, of Georgia*, 3 per cent., semi-annual.

#### Foreclosure Sales.

The *Carolina Central* road was sold in Wilmington, N. C., May 31, under a decree of foreclosure, and bought for \$1,200,000 by T. O. French, A. V. Graves, D. R. Murchison, James S. Whedbee and A. V. Stout, a committee representing the first-mortgage bondholders. The road extends from Wilmington through Charlotte to Shelby, 242 miles; its bonded debt consists of \$3,000,000 first and \$3,000,000 second mortgage bonds, and there are also \$400,000 Wilmington Bridge Company bonds guaranteed, on which interest has been regularly paid. The stock is \$4,202,000. The road was originally the Wilmington, Charlotte & Rutherford, and part of it was built just before the war. It was sold under foreclosure April 10, 1878, and

bought by the bondholders, who organized the present company, and afterward filled up a gap of 57 miles between Lilesville and Charlotte, and extended the Western Division from Cherryville to Shelby, 12 miles. The present foreclosure proceedings were begun and receivers appointed in April, 1876. The net earnings for four years past have averaged \$141,177, or \$583 per mile.

#### New England Conductors' Benefit Association.

At the annual meeting of this Association in Boston, May 26, President Paine presided. The reports showed that there are now 300 members, representing nearly all the roads in New England. There is a balance of \$136.20 in the treasury. The Association has been remarkable for its good fortune, no deaths having occurred which required an assessment for 15 months past.

#### ELECTIONS AND APPOINTMENTS.

*American Society of Civil Engineers.*—This Society has chosen Baron M. M. von Weber, who is expected to arrive in this country early next week, an honorary member—the highest honor which it can bestow.

*Baltimore & Potomac.*—At the annual meeting in Baltimore, June 2, the following directors were chosen: A. J. Cassatt, George B. Roberts, George Small, B. F. Newcomer, Wm. T. Walters, Dr. Eli J. Henkle, Samuel Cox, Jr., J. N. DuBarry, Oden Bowie. The board re-elected Oden Bowie President; A. J. Cassatt, Vice-President; John Crowe, Secretary and Auditor; John T. Leib, Treasurer.

*Barclay Railroad & Coal Co.*—At the annual meeting recently the following were chosen: President, Edward M. Davis; Directors, J. Raymond Claghorn, Edward Hoopes, Edward Lewis, Charles W. Trotter, Wm. B. Warner, I. V. Williamson; Secretary and Treasurer, Harvey Shaw.

*Breakwater & Frankford.*—At the annual meeting in Georgetown, Del., last week, the following directors were chosen: Charles C. Stockley, N. L. McCready, John Bodine, Henderson Moore, Thomas Baumgardner, Ebe W. Tunnell, Benjamin Burton, John T. Long, William S. Phillips. The board re-elected Charles C. Stockley President. The road is worked by the Junction & Breakwater Company.

*Broadway Underground.*—The officers of this company are: President, Robert Sewall; Directors, Douglas Campbell, DeWitt C. Brown, Henry Sheldon, James F. Pierce, O. Vanderburg, Walter J. Morris; Secretary, James F. Ruggles.

*Canada Southern.*—At the annual meeting in St. Thomas, Ont., June 2, the old board was re-elected, as follows: Wm. H. Vanderbilt, Cornelius Vanderbilt, James Tillinghast, Augustus Schell, Samuel F. Barger, Sidney Dillon, E. A. Wickes, A. G. Duhman, Joseph E. Brown.

*Chester & Lenoir.*—At the annual meeting in Chester, May 20, the following were chosen: President, W. Holmes Hardin, Chester, S. C.; Directors, J. L. Agurs, J. H. Smith, Chester, S. C.; A. J. Hart, J. F. Wallace, York, S. C.; M. Mason, Gaston, N. C.; Capt. Mackbee, Lincolnton, N. C.; Maj. Finger, Newton, N. C.; Col. Harper, Lenoir, N. C.; Secretary and Treasurer, M. Mason.

*Chicago & Iowa.*—The Aurora board of directors, to whom the road has been surrendered by order of Court, have appointed Mr. George Alexander General Superintendent. He has been heretofore Division Superintendent on the Chicago, Burlington & Quincy.

The board consists of the following: R. B. Montoney, D. B. Waterman, G. W. Kretzinger, L. D. Brady, E. R. Allen, D. Valentine, Joseph Rising.

*Concord.*—The new board has elected J. Thomas Vose, President; J. W. Fellows, Clerk.

*Concord & Claremont.*—At the annual meeting in Concord, May 26, the following directors were chosen: David W. Johnson, Claremont, N. H.; Mason W. Tappan, Bradford, N. H.; John Kimball, Charles P. Sanborn, Henry C. Sherburne, George E. Todd, Concord, N. H.; Charles Stearns, Boston; Clerk of the corporation, John Y. Muggridge, Concord.

*Danville, Tuscola & Western.*—The officers are: President, Isaac Porter; Secretary, Wm. E. Levensgood. Office at Danville, Illinois.

*East Tennessee, Virginia & Georgia.*—Col. E. W. Cole, late of the Nashville, Chattanooga & St. Louis, becomes President of this company, and not General Manager, as reported last week. He was chosen to the office at a meeting of the board in Knoxville, May 27. Mr. R. T. Wilson, late President, was at the same time chosen Managing Director and Financial Agent.

*Erie & Western Transportation Co.*—At the annual meeting in Philadelphia, June 1, the following directors were chosen: Wm. H. Barnes, George B. Bonnell, H. H. Houston, Joseph D. Potts, Wm. Thaw.

*Houston & Texas Central.*—At the annual meeting recently the following directors were chosen: E. W. Cave, A. Groesbeck, G. Jordan, A. S. Richardson, Houston, Tex.; Charles Fowler, Galveston, Tex.; A. C. Hutchinson, Charles A. Whitney, New Orleans; John J. Cisco, Richard J. Morgan, New York. The board re-elected C. A. Whitney President; G. Jordan, Vice-President and General Manager; A. S. Richardson, Secretary; E. W. Cave, Treasurer.

*Illinois Central.*—At the annual meeting in Chicago, May 26, the three directors whose terms then expired were re-elected for three years, as follows: L. V. F. Randolph, Frederick Sturges, Wm. Tracy.

*Illinois Central Proprietary Lines.*—In Chicago, May 26, the following were chosen: *Chicago & Springfield*,—President, W. K. Ackerman; Secretary, J. Dunn; Treasurer, J. C. Welling. *Clinton, Bloomington & Northwestern*,—President, W. K. Ackerman; Secretary, J. Dunn; Treasurer, J. C. Welling. *Kankakee & Southwestern*,—President, W. K. Ackerman; Secretary, W. J. Mauriac; Treasurer, J. C. Welling. *Kankakee & Western*,—President, W. K. Ackerman; Secretary, W. J. Mauriac; Treasurer, J. C. Welling.

*Jeffersonville, Madisonville & Indianapolis.*—At the annual meeting, May 19, the following directors were chosen: J. H. McCampbell, S. H. Paterson, Jeffersonville, Ind.; Jesse J. Brown, Geo. S. McKiernan, New Albany, Ind.; James L. Bradley, Edinburg, Ind.; Joseph I. Irwin, Columbus, Ind.; R. W. Thompson, Terre Haute, Ind.; D. W. Caldwell, Columbus, O.; J. N. McCullough, Thomas D. Messler, Wm. Thaw, Pittsburgh; John F. Green, George B. Roberts, Philadelphia. The board elected George B. Roberts, President; George S. McKiernan, Secretary and Treasurer. The road is leased to the Pennsylvania Company.

*Junction & Breakwater.*—At the annual meeting last week the following officers were elected: President, N. L. McCready; Secretary, William F. Vaulks; Assistant Secretary, William H. Stanford; Treasurer, Dr. David H. Houston; Executive Committee, N. L. McCready, John Bodine and Charles C. Stockley.

*Kansas City, Ft. Scott & Gulf.*—Mr. L. W. Towne has



## RAILROAD EARNINGS IN APRIL.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1880.	1879.	Inc.	Dec.	P. c.	1880.	1879.	Increase.	Decrease.	P. c.	1880.	1879.	Increase.	Decrease.	P. c.
Alabama Gt. Southern	290	290				\$ 45,344	\$ 33,404	11,880			\$ 156	\$ 115	35.4		
Atchison, Topeka & Santa Fe	1,318	924	394		42.6	692,000	542,801	149,199			525	587	27.5		
Burlington, Cedar Rapids & North	492	434	58		13.4	141,652	100,132	41,520			288	231	25.2		
Chicago & Eastern Illinois	146	146				31,625	10,372	21,253			216	133	63.2		
Central Pacific	2,428	2,180	248		11.4	1,374,000	1,406,600		32,600		566	645	2.3		
Chesapeake & Ohio	435	435				221,409	182,611	38,798			509	374	36.1		
Chicago & Alton	840	678	162		23.9	537,326	335,393	201,933			640	495	29.2		
Chi., Clinton, Dub. & Minn.	222	222				48,719	36,149	12,570			219	163	34.7		
Chicago & North Western	159	159				83,889	60,950	22,939			526	384	37.2		
Chicago, Milwaukee & St. Paul	2,486	1,772	714		40.3	871,000	678,439	192,561			350	383	28.4		
Missouri, Kansas & Texas	2,289	2,159	130		6.0	1,276,552	1,128,894	147,658			583	523	11.1		
Chicago, St. Paul & Minn.	178	178				119,129	91,913	27,216			669	516	29.6		
Chi. & West Michigan	245	245				70,010	54,061	15,949			286	221	29.5		
Cleveland, Col. & Ind.	472	472				345,199	271,627	73,572			731	575	27.1		
Cleveland, Mt. Vernon & Del.	157	157				35,094	31,322	3,772			227	200	13.7		
Denver, South Park & Pacific	147	85	62		72.9	238,939	44,660	194,279			1,625	519	212.0		
Detroit, Lansing & No.	282	282				102,061	88,049	14,012			368	321	15.9		
Eastern	282	282				192,608	154,539	38,069			683	587	15.6		
Flint & Pere Marquette	295	280	15		5.3	130,740	102,129	28,611			443	365	28.1		
Georgia	307	307				81,000	70,000	11,000			264	228	15.7		
Hannibal & St. Joseph	262	262				200,059	165,444	34,615			685	532	20.9		
Houston & Texas Central	593	501	92		6.4	247,807	158,318	89,489			465	316	55.5		
Illinois Central, Illinois lines	873	854	19		2.2	426,550	378,339	48,211			489	443	12.7		
Iowa lines	402	402				117,920	114,252	3,668			293	284	3.2		
Ind., Bloom. & Western	212	212				90,374	80,229	10,145			426	425	0.2		
International & Great Northern	526	516	10		1.9	104,090	80,540	23,550			198	159	24.5		
Kan. City, Ft. Scott & Gulf	176	160	16		10.0	61,002	61,002	0			351	381	35.5		
Kansas City, Lawrence & So.	259	167	89		53.3	65,906	33,723	32,183			257	202	27.2		
Little Rock & Fort Smith	165	165				20,061	19,740	321			102	120	34.1		
Louisville & Nashville	1,118	973	145		14.9	557,083	396,083	161,000			498	407	22.4		
Memphis, Pad. & No.	115	115				17,802	11,918	5,884			155	104	49.4		
Minneapolis & St. Louis	158	123	35		28.5	38,002	33,302	4,700			241	271	14.0		
Missouri, Kansas & Texas	818	786	32		7.9	348,275	189,217	159,058			411	241	70.5		
Mobile & Ohio	506	510			1.9	137,358	119,494	17,864			271	232	14.9		
Nash., Chattanooga & St. Louis	140	140				155,490	129,506	25,984			445	368	21.9		
N. Y. Central & Hudson River	1,018	1,018				2,782,324	2,214,626	567,698			2,731	2,175	25.6		
Norfolk & Western	326	326				380,130	328,869	51,261			1,184	1,009	17.4		
Northern Central	684	644	40		6.2	183,227	115,656	67,571			268	180	58.4		
North Wisconsin	70	62	8		12.9	6,221	5,871	350			122	95	28.6		
Ogdensburg & Lake Cham.	122	122				33,212	22,629	10,583			272	185	48.8		
Paducah & Elizabethtown	185	185				35,597	23,829	11,768			192	129	49.3		
Pennsylvania	1,808	1,716	92		5.4	3,488,367	2,630,023	858,344			1,929	1,533	25.8		
Pitts., Titusville & Buffalo	163	120	43		35.8	55,700	41,704	13,996			342	348	33.5		
St. L., At. & T. H. Main Line	105	105				105,853	70,382	35,471			543	360	50.6		
St. L., At. & T. H. Bellevue Line	71	71				4,932,614	4,331,431	601,183			648	582	11.3		
St. Louis, Iron Mt. & Southern	685	685				40,130	318,196	85,104			589	465	26.7		
St. Louis & San Francisco	578	328	250		61.0	174,503	83,736	90,767			351	255	37.6		
St. Paul & Duluth	175	169	6		3.5	39,137	27,641	11,496			224	164	41.6		
St. Paul, Minn. & Manitoba	674	560	114		20.3	333,014	239,991	93,023			494	424	16.2		
St. Paul & Sioux City	470	329	141		42.9	115,509	87,965	27,544			267	213	25.4		
Scioto Valley	100	100				20,453	21,262				213	217	3.8		
Texas & Pacific	444	444				173,000	104,103	68,897			390	234	66.1		
Toledo, Peoria & Warsaw	237	237				113,374	113,374	0			374	374	0		
Union Pacific	1,853	1,821	32		1.8	1,637,000	1,410,000	227,000			883	747	18.0		
Wabash, St. L. & Pacific	1,558	1,217	341		28.0	890,137	609,278	280,859			571	501	14.0		
Wisconsin Valley	107	90	17		18.9	33,145	14,832	18,313			310	165	48.5		
Total, 56 roads	31,399	28,176	3,223		11.4	20,345,670	15,981,039	4,418,171	\$53,541		648	567	14.2		
Total increase			3,223					4,364,631			27.3				

## RAILROAD EARNINGS, FOUR MONTHS ENDING APRIL 30.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1880.	1879.	Inc.	Dec.	P. c.	1880.	1879.	Increase.	Decrease.	P. c.	1880.	1879.	Increase.	Decrease.	P. c.
Ala. Gt. Southern	290	290				\$ 199,801	\$ 133,681	66,150			\$ 689	\$ 461	49.5		
Atch., Top. & S. F.	1,194	898	296		32.9	2,177,500	1,735,298	442,202			1,824	1,032	77.3		
Burl., Cedar Rap. & No.	492	434	58		13.4	679,494	426,095	253,399			1,383	983	40.0		
Chicago & Eastern Illinois	146	146				109,828	36,279	73,549			752	504	49.4		
Central of N. Jersey	385	385				2,520,822	2,029,227	491,595			6,563	5,201	24.3		
Central Pacific	2,358	2,180	178		8.2	4,932,614	4,832,730	99,884			2,217	1,362	62.1		
Chesapeake & Ohio	435	435				845,187	485,527	359,660			1,943	1,116	74.0		
Chicago & Alton	840	678	162		23.9	2,184,867	1,314,182	870,685			2,601	1,038	151.4		
Chi., Clinton, Dub. & M.	222	222				201,225	151,349	49,876			906	682	32.4		
Chi. & Eastern Illinois	159	159				327,698	256,575	71,123			2,061	1,614	27.7		
Chi., Mil. & St. Paul	2,391	1,772	619		34.9	3,274,000	2,379,178	894,822			1,369	1,343	26		
Chi. & N. W.	2,289	2,159	130		6.0	4,924,592	4,133,880	790,712			2,151	1,915	12.3		
Chi., St. Paul & Minn.	178	178				305,041	319,765				2,119	236	23.5		
Chi. & West. Mich.	245	245				750,031	651,428	98,603			1,070	818	30.9		
Cleveland, Col. & Ind.	472	472				1,481,843	1,128,917	352,926			3,139	2,392	27.7		
Cleveland, Mt. V. & Del.	157	157				139,735	111,917	27,818			882	747	17.7		
Denver, S. Park & Pa.	147	85	62		72.9	716,886	135,955	580,931			4,877	1,590	307.8		
Detroit, Lansing & No.	205	201	4		2.0	373,044	299,024	74,020			1,829	1,453	25.7		
Eastern	282	282				803,906	697,551	106,355			3,063	2,474	58.0		
Flint & Pere Mar.	295	280	15		5.3	505,770	355,480	150,291			1,717	1,270	44.4		
Grand Trunk	1,273	1,390			11.7	3,257,331	2,829,824	427,507			2,559	2,036	25.7		
Great Western	526	526				1,557,967	1,386,991	170,976			2,962	2,637	12.2		
Hannibal & St. Jo.	292	292				750,031	651,428	98,603			2,508	2,391	4.6		
Houston & Texas Cent.	531	501	30		6.4	1,077,384	873,325	204,059			2,041	1,900	7.4		
Ill. Cen., Ill. lines	873	854	19		2.2	1,781,783	1,022,957	758,826			1,249	1,117	13.2		
Ill. Cen., Iowa lines	402	402				502,150	448,907	53,243			1,249	1,117	13.2		
Ind., Bloom. & West.	212	212				377,017	336,702	40,315			1,778	1,588	12.0		
Inter. & Gt. Northern	526	516	10		1.9	519,678	511,964	7,714			992	922	7.6		
Kan. City, Ft. S. & Gulf	176	160	16		10.0	367,245	241,476	125,769			2,087	1,500	39.1		
Kansas City, Lawrence & So.	259	167	92		55.1	218,930	126,909	92,021			912	760	19.2		
Little Rock & Ft. S.	165	165				148,747	91,751	56,996			912	760	19.2		
Louisville & Nashville	1,118	973	145		14.9	2,411,573	1,698,799	712,774			2,157	1,746	23.5		



**St. Louis, Iron Mountain & Southern.**—Mr. R. C. Kerens has been appointed Manager of the Express Department, and Mr. James Atkin Superintendent of the same.

**Scioto Valley.**—Mr. William Adams, Jr., of New York, has been chosen President, in place of George D. Chapman, who resigns in order to devote his time to the building of the Ohio River road, which is to connect the Scioto Valley with the Chesapeake & Ohio.

**State Line & Sullivan.**—The officers lately chosen are as follows: President, J. Raymond Claghorn; Directors, Wm. B. Bullock, N. N. Betts, Edward M. Davis, J. F. Audenried, Thomas Mott, Edwin Lewis, Wm. N. Whelen, R. H. Rochester, F. H. Odiorne; Secretary, O. A. Baldwin; Treasurer, H. C. Davis; Auditor, N. N. Betts; Superintendent and General Manager, I. O. Blight.

**Sullivan County.**—At its annual meeting, recently, this company elected Henry C. Sherburne, President and John H. Albin, Clerk. The road is leased to the Central Vermont.

**Suncook Valley.**—At the annual meeting last week the following directors were chosen: Samuel N. Bell, Charles H. Carpenter, Martin Van Buren Egerly, Reuben L. French, Natt Head, Frederick Smyth, Lemuel B. Towle. The road is leased to the Concord Company.

**Suncook Valley Extension.**—At the annual meeting last week the following directors were chosen: Samuel N. Bell, James H. Colbath, Thomas Cogswell, John M. Durgin, Natt Head, Frederick Smyth, Daniel E. Tuttle.

**Toledo, Delphos & Burlington.**—The board of directors met in Boston, May 27, and elected Gen. John M. Corse, President; James Irvine, Vice-President and General Manager; Louis Curth, Jr., Secretary and Treasurer; Wm. H. Andrews, Assistant Treasurer.

**West Chester & Philadelphia.**—The controlling interest in this company having been sold to the Philadelphia, Wilmington & Baltimore, a meeting was held June 1, at which the following were chosen: President, Henry Wood; Directors, Samuel M. Felton, William Sellers, David Woolpper, H. E. Kenney, Robert Craven, Charles Warder, Charles P. Bowditch, Robert H. Stevenson, Isaac Hinkley. Mr. Wood will have immediate charge of the road; he is also Manager of the Philadelphia & Baltimore Central road, which is controlled by the Philadelphia, Wilmington & Baltimore.

**Wilton.**—At the annual meeting in Nashua, N. H., the following directors were chosen: Solomon Spaulding, John A. Spaulding, John Reed, Wm. Ramsdell, J. T. Greeley. The road is leased to the Nashua & Lowell.

**Wisconsin Central.**—At the annual meeting in Milwaukee, May 27, the following directors (one-third of the board) were chosen: B. K. Miller, Milwaukee; Wm. T. Glidden, E. B. Phillips, Boston.

#### PERSONAL.

—Mr. J. Boykin Biliups has resigned his position as General Agent of the Pensacola Railroad, to take charge of the Sullivan Mills at Molino, Fla.

—Mr. G. W. P. Atkinson has resigned his position as Purchasing Agent of the Kansas City, St. Joseph & Council Bluffs, the Kansas City, Fort Scott & Gulf and allied roads.

—Mr. Max Zürcher, formerly connected with the American, the Keystone and the Phoenix Bridge companies, has removed to Denver, Col., where he will establish a general engineering office.

—It is reported that Senator John B. Gordon, of Georgia, resigned his seat in the Senate to accept a position as Joint Counsel for the Central, of Georgia, the Georgia and the Louisville & Nashville Companies.

—Col. Thomas P. Hardee, State Engineer of Louisiana, and Vice-President of the American Society of Civil Engineers, died in New Orleans, May 21. He was a graduate of West Point, and had served in the United States Engineer Corps, and as Engineer on Gen. Johnston's staff in the Confederate Army.

—Mr. Charles Howard having resigned his position as Superintendent of the Cincinnati, Sandusky & Cleveland road, a number of the business men of Springfield, O., and other towns on the line have united in a memorial requesting that his resignation be not accepted, and that he be retained in charge of the road.

—Mr. Jeremiah M. Smith, Assistant Superintendent of the Philadelphia, Wilmington & Baltimore road, died in Philadelphia May 26, aged 65 years. He had been on the road between Baltimore and Philadelphia, nearly all his life, beginning as a stage-driver in ante-railroad days. In 1839 he went on the railroad as a brakeman, and worked his way gradually up to his late position, to which he was appointed in 1864.

—The lady who owns more railroad securities than any other woman in America is said to be Mrs. E. H. Greene, of New York, wife of the Vice-President of the Louisville & Nashville Company, daughter and heiress of an old and wealthy New Bedford family, whose fortune had been made in the whaling business when New Bedford was a rich and prosperous port; she married a wealthy man, and has been able to apply most of the income from her large property to new investments, increasing the principal yearly. She is said to live very quietly and simply.

#### TRAFFIC AND EARNINGS.

##### Railroad Earnings.

Earnings for various periods are reported as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Second week in May:				
Minn. & St. Louis.....	\$10,148	\$6,580	I.	\$3,568 54.1
Third week in May:				
Chi. & Eastern Ill.....	\$24,953	\$16,885	I.	\$8,068 47.7
Flint & Pere Marquette.....	25,817	19,371	I.	6,446 33.2
St. L., Iron Mt. & So.....	95,030	80,828	I.	14,202 17.6
Week ending May 22:				
Grand Trunk.....	\$191,538	\$155,114	I.	\$36,424 23.4

##### Grain Movement.

For the week ending May 23 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets, and receipts at the seven Atlantic ports have been, in bushels, for the past seven years:

Year.	Northwestern receipts.	Total.	By rail.	P. c.	Atlantic receipts.
1874.....	5,970,382	3,595,353	956,626	25.9	3,528,682
1875.....	2,765,782	2,782,468	1,003,242	35.8	2,681,075
1876.....	3,286,744	3,567,864	1,820,456	51.0	5,316,566
1877.....	2,294,405	2,330,304	794,342	34.1	3,506,828
1878.....	5,929,890	4,907,025	1,957,051	39.9	6,117,072
1879.....	3,713,978	4,802,116	2,470,084	51.5	5,977,584
1880.....	6,220,796	5,231,104	1,457,857	27.8	4,990,665

The receipts of the Northwestern markets are one-fourth larger than the preceding week (which were the largest of the year till that week), and have been equalled but twice before in a week before harvest—namely, in the first week of June, 1879, and in the last week of May, 1878. They have

often been exceeded after harvest, however. The shipments of these markets are also the largest of the year, but there were two weeks last year before harvest when they were exceeded—none in any previous year. The rail shipments were large, but have been exceeded twice since navigation opened. The receipts at Atlantic ports were a sixth less than in the week preceding, and have been exceeded five times this year. The receipts of New York alone, compared with the previous week, fell off 2,350,000 bushels, or more than one-half, while there was a very large increase at Philadelphia and Baltimore.

Of the receipts at Northwestern markets, Chicago had 56.6 per cent., Toledo 11.7, St. Louis 10.8, Peoria 9.4, Milwaukee 7.5, Detroit 1.7, Duluth 1.5, and Cleveland 0.8 per cent. This is the first week since last fall that receipts have been reported at Duluth.

Of the receipts at Atlantic ports, New York had 42.7 per cent., Philadelphia 23.2, Baltimore 11.6, Boston 7.3, New Orleans 5.4 and Portland 0.1 per cent. The week before New York had 71 and Philadelphia and Baltimore together 14.5 per cent., against 42.7 to 34.8 this last week.

Exports of flour and grain for four weeks have been:

	May 26.	May 19.	May 12.	May 5.
Flour, bbls.....	71,575	60,714	89,533	75,479
Grain, bush.....	4,644,125	4,210,050	2,829,626	3,065,175

The export movement thus has been increasing of late. It is not, however, larger than was common before May and in the winter.

The United States Bureau of Statistics reports that the exports of wheat and flour from July 1, 1879, to March 31, 1880, nine months, were equivalent to 140,967,638 bushels of wheat this year, against 115,872,802 bushels in the corresponding period of 1878-79, showing an increase of 25,094,836 bushels, or 21½ per cent. This includes exports from all United States ports, and so excludes Montreal exports, which are included with returns of exports from Atlantic ports, but includes Pacific exports, which are very large.

For the week ending May 28 receipts at the four leading Eastern ports were:

	1880.	1879.	Increase.	P. c.
New York.....	4,190,587	3,189,094	1,010,484	31.7
Baltimore.....	788,376	774,702	13,574	1.7
Philadelphia.....	1,731,400	1,087,300	644,100	59.2
Boston.....	393,295	339,250	54,045	16.0
Total.....	7,112,549	5,390,346	1,722,203	32.0

This is an exceedingly large movement, and it is notable that the Baltimore and Philadelphia receipts, which for some time had been quite small, have become large again, Philadelphia's being among the largest ever known. For the five months ending with this week New York's receipts have been 447,000 bushels (1.3 per cent.) greater, and the aggregate receipts of the other three ports 5,273,000 (12 per cent.) less than last year.

For the week 1,149,582 bushels of New York's receipts (27.4 per cent.) were by rail, against 1,106,152 bushels (34.7 per cent.) last year.

For the same week Buffalo receipts and shipments were:

	Receipts.	Shipments.
By rail.....	609,500	808,300
By water.....	2,594,805	1,981,964
Total.....	3,204,305	2,770,264

There is a considerable decrease in rail receipts compared with last year, but, in spite of the much higher rail rates, there is an increase of 13½ per cent in the shipments by rail, canal shipments being 43 per cent. greater.

Receipts and shipments at Chicago and Milwaukee for the same week were:

	Receipts.	Shipments.
Chicago.....	4,800,361	2,932,746
Milwaukee.....	481,119	741,700
Total.....	5,281,480	3,674,446

The receipts of Chicago recently have been enormous, but Milwaukee has had a very light business this season.

The receipts of grain in Chicago during the week ending May 29 were 5,885,860, and the largest ever known. Of these receipts 4,031,080 bushels, or 70½ per cent., were of corn.

Baltimore grain receipts for May were as follows:

	1880.	1879.	Decrease.	P. c.
Flour, barrels.....	94,412	97,021	2,609	2.7
Wheat, bushels.....	1,491,124	1,633,801	142,737	8.7
Corn.....	670,237	2,435,855	1,765,618	72.5
Other grain.....	152,102	203,212	51,110	25.2
Total grain.....	2,313,463	4,272,928	1,959,465	45.8

Total flour reduced to wheat..... 2,785,523 4,758,033 1,972,510 41.5

Receipts for the five months ending May 31 were as follows, flour reduced to wheat in the totals:

	1880.	1879.	Decrease.	P. c.
Flour, barrels.....	478,317	536,958	58,641	10.9
Grain, bushels.....	17,148,550	21,304,255	4,155,705	19.5
Total, bushels.....	19,540,135	23,980,045	4,439,910	18.5

May exports were 39,032 barrels and 26,630 sacks of flour, and 2,468,333 bushels grain.

Buffalo receipts up to May 31 are reported by the Commercial Advertiser of that city as follows, flour in barrels and grain in bushels:

	Flour.	Grain.
By lake.....	159,912	70,321
By rail.....	379,700	538,400
Total.....	539,612	608,621

Shipments eastward of grain received by lake were as follows:

	1880.	1879.	Increase.	P. c.
By canal, bushels.....	11,532,529	6,506,621	5,025,908	77.2
By rail.....	7,438,750	2,172,134	5,266,616	242.5
Total.....	18,971,279	8,678,755	10,292,524	118.6

The canal opened April 20 in 1880, and May 8 in 1879.

##### Erie Canal Traffic.

The total movement of freight in both directions on the New York canals (almost all on the Erie and the Champlain canals) from May 15 to May 25 were 228,567 tons this year, against 174,490 last year, the increase being 55,077 tons, or 3.2 per cent. The changes in the chief items are shown below in tons:

	1880.	1879.
Lumber.....	50,228	39,969
Grain.....	71,590	52,090
Coal.....	30,917	42,558
Iron ore.....	19,260	5,905
Stone, lime and clay.....	7,628	5,110
Pig iron and rails.....	6,091	1,729
Salt.....	2,307	3,220
Petroleum.....	2	1,898
Totals, of above.....	190,993	152,499

More than four-fifths of the total increase was in these articles, which bear the lowest rates of freight. In articles

which the railroads get more than the rates of the lowest class for, there is generally a decrease on the canal this year, as shown below:

	1880.	1879.
Dried fruit.....	31	375
Cotton.....	0	43
Domestic cottons and woolsens.....	207	1,391
Sugar.....	1,445	1,837

These, however, are but a small proportion of the whole canal traffic.

The business of the canal at Buffalo from the opening to May 31 was as follows:

	1880.	1879.	Increase.	P. c.
Boats cleared.....	1,730	838	892	106.4
Tolls received.....	\$120,822	\$50,811	\$69,011	112.7

The canal opened April 20 this year and May 8 last year.

##### Newburg Line.

Arrangements are being made for a new through freight line between New England and the West by the Connecticut Western, the Newburg, Dutchess & Connecticut and the New York, Lake Erie & Western. There will be a ferry transfer across the Hudson between Dutchess Junction and Newburg.

##### New York-Boston Passenger Rates.

There are reports of an agreement between the Old Colony and the New York, Providence & Boston companies, by which each company is to withdraw one of its lines between Boston and New York, and the fare between the two cities is to be raised from \$1 to \$3.

##### Lake Superior Iron Ore.

Shipments of iron ore from the Lake Superior Region from the opening of navigation up to May 26 were, in tons:

	1880.	1879.	Increase.	P. c.
From L'Anse.....	5,010	2,520	2,484	98.3
" Marquette.....	77,495	32,734	44,771	136.9
" Escanaba.....	183,917	73,750	110,167	152.1
Total.....	268,422	109,004	159,422	146.3

Shipments of pig iron for the same period were 1,806 tons, all from Carp River Furnace.

##### Cotton.

For the nine months of the crop year from Sept. 1 to May 28 receipts at the seaboard have been, in bales, for the past five years:

	1880.	1879.	1878.	1877.	1876.
4,739,442	4,389,721	4,193,104	3,905,643	4,078,014	

The increase this year over last is 349,721 bales, or about 8 per cent. For the same period the exports were 3,444,769 bales this year against 3,285,506 last—an increase of 159,263 bales, or 4½ per cent. Receipts for the next three months are usually very light.

The percentage of the total receipts for two years arriving at each of the leading markets, and of the exports thence for this year have been:

	Receipts.	Exports.
	1880.	1879.
New Orleans.....	39.7	26.6
Savannah.....	15.2	16.0
Norfolk.....	14.8	12.6
Charleston.....	10.0	11.7
Galveston.....	9.8	12.7
Mobile.....	7.4	8.2
New York.....	4.0	3.3
Florida.....	0.4	1.3
North Carolina.....	2.2	3.1
Other.....	5.5	4.5
Total.....	100.0	100.0

The Norfolk business is of comparatively recent growth, which has increased rapidly and is seen by this to have continued to increase rapidly this year. The decrease in proportion (and there is a decrease of nearly a sixth in quantity), at Galveston, is probably due to the drought which reduced the crops in Texas, though it may also be partly due to the diversion of shipments to the North—especially to St. Louis.

#### THE SCRAP HEAP.

##### Railroad Equipment Notes.

The Portland Company, at its recent annual meeting in Portland, Me., re-elected E. H. Davels, President. A dividend of \$3 per share was declared.

The Hartford shops of the New York, New Haven & Hartford road have just completed a new passenger engine.

Very early on the morning of the 21st fire was discovered in the Empire Car Works of Michael Schall, at York, Pa., and, in spite of the efforts of the local fire department, the main building was almost entirely destroyed. It was of brick, 72 by 250 ft., and two stories high. The loss is estimated at \$50,000 and is partly covered by insurance.

The Pennsylvania Railroad Shops at Altoona have just completed a new passenger engine with 19 by 24 in. cylinders and driving-wheels 5 ft. 8 in. diameter. It is the first of several intended for service on the New York Division.

A large number of men have been discharged from the Philadelphia & Reading shops in Reading, Pa., and the shops have been put on eight hours' time. It is thought that the curtailment is only temporary.

The Chicago Forge & Axle Works are running full time on car-axes and other forgings.

The Vulcan Iron Works, Chicago, have just completed a car pile-driver for the St. Paul, Minneapolis & Manitoba road.

The Russell Wheel & Foundry Co., at Detroit, Mich., has completed new shops with all the latest improvements. They include a wheel foundry with a capacity of 50 wheels per day and a large foundry with appliances for making castings of all sizes.

The new works of Chapin & Lantz, in Allegheny, Pa., recently turned out their first engine, a passenger engine for the Lawrenceville & Evergreen narrow-gauge road. The firm is composed of Messrs. Melchior B. Chapin, of Pittsburgh, and John A. Lantz, formerly of the National Locomotive Works at Connelville, and of the McKeesport Car & Locomotive Works. They will build light engines entirely.

The sum of \$30,000 has been raised in Watertown, Northumberland County, Pa., to start car works there.

##### Iron and Manufacturing Notes.

The Cape Ann Forge Works, at Gloucester, Mass., have made additions to and alterations of their works, and are now prepared to do all kinds of heavy forging and railroad work, in addition to the manufacture of anchors, formerly their chief business. They are at present at work on a large order for heavy shafting for the Holyoke Manufacturing Co., and in making car-axes and repairing rails for the Eastern Railroad.

The rolling-mill of the Norton Iron Co., at Ashland, Ky., was started up May 17. The blast furnace is running steadily.

The Schuylkill Iron Co. is about to build a large blast furnace at Phoenixville, Pa.

The Vulcan Iron & Nail Works, at Chattanooga, Tenn.,



have been thrown into bankruptcy on petition of a number of creditors. The Tennessee Court of Chancery, in which the proceedings were taken, has appointed James C. Warner, of Nashville, Receiver, directing him to continue to operate the works as long as it can be done without loss. The works are the largest nail, bolt, spike and bar mill in the South.

The iron works at Upper Woodstock, N. B., have been sold to parties from Providence, R. I., with the condition that the New Brunswick Railway shall build a branch from Woodstock to the furnace.

The new furnace at Chambersburg, Pa., went into blast last week.

The furnace at Cornwall, Pa., has gone out of blast, the high price of coal and ore being given as a reason.

The Martha Bennett furnace, at Port Carbon, Pa., has been repaired and relined, and went into blast June 1.

The Jefferson Iron Works, at Steubenville, O., have resumed operations after a suspension of about a month.

The blast furnace of the Joliet, Ill., Iron & Steel Co. was started up last week, after standing idle over a year.

#### Bridge Notes.

The King Iron Bridge & Manufacturing Company, of Cleveland, O., has taken the contract to build two highway bridges in Bartholomew County, Ind., one to have two spans of 160 ft. each, the other two spans of 85 feet each.

Wilkins, Post & Co., of the Atlanta (Ga.) Bridge Works, have just completed two spans, of 130 ft. each, over Uchee Creek, for the Mobile & Girard road. The bridge is a combination Pratt truss. They also have contracts for six, all wrought iron, spans for the East Tennessee, Virginia & Georgia; one double-track iron bridge over the Holston at Strawberry Plains, and five smaller ones for the Holston, near Union, Tenn.

#### She Thought it was no Good.

The conductor after punching her ticket handed it back to the old lady, to be held, of course, until he should collect the tickets at the other end of the road. She looked at the hole made in the ticket and then threw it out of the window. When the conductor made his final trip through the train, she told him what she had done.

"What did you do that for?" he asked in amazement. "Fait, an' yez didn't want it shure, and I didn't naither, an' I dung it out, the little hole yez made in it an' all."—*Cleveland Herald.*

#### Caught in a Tunnel.

A correspondent of the Chicago Times, writing from St. Louis, May 23, says:

"At a late hour to-night several hundred people narrowly escaped being suffocated to death in the tunnel. The Emerald Social Club held their annual picnic at Oak Hill, on the Southeastern Railroad, and the train, consisting of thirteen crowded coaches, was on the way to the Union Depot. At the curve, which extends from a point under Washington avenue, just west of Seventh street, to a point about under the corner of Locust and Eighth streets, the train came to a dead standstill, the engine being powerless to go ahead or back. The engineer put on all the steam at his command, and the iron horse puffed and snorted at a furious rate for a full ten minutes, but not an inch could the coaches be moved. By this time the cars were filled with smoke, and half-strangled men, women and children rushed for the platform for air. Several women were trampled upon by the thoroughly frightened and panic-stricken crowd, while others fainted away in their seats. Those who got out of the cars found the tunnel even worse. The smoke and coal gas were stifling, and another break to get back to the seats overturned other women. The few men on the train who retained their presence of mind jumped from the cars, pulled their wives and companions after them, and prostrated themselves on the ground, where the smoke was not so dense. Meantime the engineer blew his distress signal on the whistle and engines were run in to the rescue. Their united strength pulled the train out into the pure air. It will be days before many of those hurt recover from their injuries."

#### Sun-Struck.

Last week added another to the dangers to which train-men are subjected. The Port Jervis Gazette of May 29 says:

"Thursday afternoon John S. Burns, on Conductor John Snook's train, was sent back with a flag at Sufferns. He ran part of the way, and the sun shining hot upon him he suffered severely with the heat. Presently the perspiration stopped, and he felt faint and clung to a switch-target. Seeing a train coming he flagged it, and then became unconscious. He was discovered soon after lying beside the track, and was taken to Suffern, where medical attendance was given him. He remained unconscious until taken to the depot. In the evening he was brought to his home in Port Jervis. He is now recovering from the sun-stroke."

#### Fast Time.

On May 24, an engine on the Connecticut River road ran the 17 miles from Northampton, Mass., to Springfield, in 18½ minutes. The engine was light, with no train, and made no stops, but had to slow up at several points where there were curves, in order to look out for a construction train.

#### An Old Engine.

A strange nondescript has just been received for repairs at the Grant Locomotive Works, and crowds of workmen are attracted to look at it. There is little likeness about it to a locomotive engine such as may be seen at the present day, still it purports to be something of the sort. It was what was once known as the "grasshopper" or "wheelbarrow" engine, and it is said that this class was once used for switching purposes on the Old Paterson & Hudson River road. The front truck is placed on four wheels and there are two drivers directly under the cab. The build is of the rudest description, the frame timbers very heavy, looking for all the world as if merely hewn out. It must be seen to be appreciated; as for description, the nearest we can come to it is to liken it to a steam road roller, which it resembles as much as anything else. The engine came here from Oil City, is named "Logan," and was built by Barnum, Richardson & Co., Chicago, in 1833.—*Puterson (N. J.) Press.*

#### OLD AND NEW ROADS.

**Alabama Great Southern.**—Work has been begun on the grading of a new line for this road from Chattanooga, Tenn., to Wauhatchie, where it now uses the Nashville, Chattanooga & St. Louis track. The distance is five miles, and the estimated cost \$187,000, some heavy work being required, including a tunnel through a spur of Lookout Mountain. The work will, it is expected, take four or five months.

**Arkansas & Louisiana.**—It is proposed to build a railroad from Monticello, Ark., on the Little Rock, Mississippi River & Texas road to Monroe, La., on the Vicksburg,

Shreveport & Pacific. The distance is about 90 miles, through a fine cotton country. Some subscriptions have already been secured.

**Baltimore & Delta.**—The Belair (Md.) *Intelligencer* says: "It is understood that the Philadelphia, Wilmington & Baltimore Railroad Company has recently conferred with the directors of the Baltimore & Delta Railroad Company, whose road is now under construction from Delta, York County, Pa., to Baltimore, by way of Belair. The object of the Philadelphia, Wilmington & Baltimore Railroad Company was to ascertain what prospect exists for the early completion of the narrow-gauge road from Baltimore to Belair. It was intimated that as soon as the Baltimore & Delta road is completed between the points named, the Philadelphia & Baltimore Central Railroad will be continued from Port Deposit to Belair, where a junction will be formed with the narrow-gauge railroad."

**Boston, Hoosac Tunnel & Western.**—The agreement of consolidation of the New York and Vermont corporations of this name has been ratified by the stockholders of both companies. The consolidation is purely formal, the stock of both being owned by the same parties, and the separate organizations being necessary only to comply with some requirements of the law in both states.

**Broadway Underground.**—A new company has been formed under an old charter to build an underground road under Broadway and Madison avenue, New York, from the City Hall to Central Park. It is said that some French capitalists have agreed to furnish the money. The scheme will meet with strong opposition, as it did when first proposed.

**Burlington & Missouri River in Nebraska.**—The stockholders having finally voted to ratify the agreement of consolidation with the Chicago, Burlington & Quincy Company, the stock of the consolidated company is now being issued for the old stock.

**Carson & Colorado.**—This company has been organized and has begun work on a road about 150 miles long from Carson, Nev., to the town of Candelaria in the Columbian mining district. The road is not intended to stop at that point but to extend beyond to some point not yet decided on in Southern Nevada.

**Chester & Lenoir.**—Work is soon to be begun laying the track from Dallas, N. C., to Newton, 33 miles, the road being all graded. Of the issue of \$250,000 bonds authorized, \$50,000 have been sold for cash. All of the old bonds have been retired and the floating debt funded in the new mortgage.

**Chicago & Iowa.**—Interest due having been paid as directed by the United States Circuit Court, the Court last week entered a decree directing that the Receiver turn over the road to the company May 31, reporting all outstanding claims and accounts at that time to the Court. The Court recognizes as legal representatives of the company the directors chosen in March last, chiefly by vote of the Aurora stock, when F. E. Hinckley, the Chicago, Burlington & Quincy, and other parties claiming to hold stock, were enjoined from voting.

**Chicago, Milwaukee & St. Paul.**—This company, it is said, has bought the Pine River Valley & Stevens Point road, a little narrow-gauge branch running from Lone Rock, Wis., on the Prairie du Chien Division, to Richland Centre, 16½ miles.

A contract has been let for the grading of 16 miles of the line which is to connect the Hastings & Dakota Division with Minneapolis. The new road will leave that division near Benton, Minn., and is located thence to Island Lake on the Minneapolis & St. Louis road.

**Cleveland, Mt. Vernon & Delaware.**—In the Court of Common Pleas at Akron, O., May 27, the representatives of the Amsterdam bondholders began a suit to foreclose the mortgage on this road. The road extends from Hudson, O., to Columbus, 144 miles, with a leased branch to Massillon, 12.5 miles. Its bonded debt consists of \$1,350,000 first mortgage bonds, \$950,000 Columbus extension bonds, \$518,492 funded coupons and \$669,000 income bonds. It has not earned interest, and a partial funding arrangement was made several years ago.

**East Tennessee, Virginia & Georgia.**—The Chattanooga (Tenn.) *Times* of May 26 says:

"Surveys will at once be made for the extension of the Memphis & Charleston road from Stevenson, Ala., to this city, via the Cincinnati Southern bridge, six miles above this point, thus placing the Memphis road in an independent position, it being at present in the power of the Louisville & Nashville management, using 40 miles of their track from Stevenson to Chattanooga. This road will be about 38 miles in length, and will place Memphis five miles nearer Atlanta than via the Nashville & Chattanooga. It will run through a very fertile country; the grades are comparatively easy, no bridges are to be built, and, with the exception of one or two tunnels, the entire road can be built without any difficult engineering."

A road will also at once be surveyed from Red Clay, Ga., on the Dalton arm of the East Tennessee, Virginia & Georgia Railroad to Ooltewah on the Chattanooga arm. This road will give Chattanooga a second connection with Dalton, only one mile longer than the Western & Atlantic connection."

**Grand Trunk.**—At a meeting of the stockholders and bondholders of the Port Dover & Lake Huron and Stratford & Huron railways, which was held at Woodstock, Ont., recently, it was resolved by a large majority to lease the road to the Grand Trunk Railway. The agreement with the Grand Trunk Railway provides that it shall operate both the Port Dover & Lake Huron and Stratford & Huron railways for 21 years, at a rental of 25 per cent. on the gross earnings up to \$7,000 a mile, and 12½ per cent. of the gross earnings beyond that amount. The Grand Trunk Railway is to provide all the working expense, and maintain the right of way and the necessary renewals. The arrangement embraces the proposed extension from Listowel to the Georgian Bay, which is also to be bonded over when completed. It is estimated that the proposed rental will, with the present receipts, yield a dividend of about 4 per cent. on the amount invested by the bondholders, the ordinary stock being, as has been long assumed, practically worthless. The Stratford & Huron Railway is a subsidiary line of the Port Dover & Lake Huron, having been leased to it since the completion of the former in 1877.

The Port Dover & Lake Huron extends from Port Dover on Lake Erie to Stratford on the Grand Trunk, 63 miles. The Stratford & Huron runs from Stratford north to Listowel, 28 miles.

**Green Bay & Minnesota.**—The Receiver of this road has agreed to build a branch from Plover, Wis., to Stevens Point, eight miles, provided \$15,000 local aid is given.

**Illinois Central.**—Work is progressing on the extension of the branch line from Pontiac, Ill., to Minonk on the North Division. Tracklaying is now in progress west of Pontiac.

**International & Great Northern.**—A very large

force is now at work on the extension from Austin, Tex., to San Antonio. Grading is in progress all along the line from Austin to New Braunfels.

**Jerome Park.**—This road is a short spur about a mile long, running from the New York & Harlem road to the race-course at Jerome Park. It is intended chiefly to carry people to the races, but it also accommodates quite a number of residents on the line, and about the park. It will be run in connection with the Harlem road. The mile of main track and about one-half mile of loops and sidings were graded and finished in 34 days. The road was open for business May 29, and regular trains are now running.

**Junction & Breakwater.**—At the annual meeting last week this company voted to authorize a lease of the Baltimore, Chesapeake & Delaware Bay road, so soon as it shall be completed from Harrington, Del., to Kent Island, Md. This arrangement probably secures the construction of the road.

**Lake Erie & Western.**—This company has given notice to the New York Stock Exchange of an intended increase on June 25 of 7,000 shares (\$700,000) of its capital stock, on account of the construction of its Sandusky Division, purchase of equipment and terminal property.

**Lake Shore.**—This company has been lately organized and is now having surveys made for a line about 35 miles long, extending from the Boston, Concord & Montreal at Meredith Village, N. H., through the towns of Meredith, Centre Harbor, Moultonboro, Sandwich, Conway and Bartlett to Bartlett station on the Portland & Ogdensburg road. It will skirt along the edge of the White Mountains.

**Logansport, Kewana & South Bend.**—This company has been organized to build a railroad from Gebhart, Ind., on the Columbus, Chicago & Indiana Central, north to South Bend, a distance of 75 miles.

**Louisville, Harrods Creek & Westport.**—Messrs. J. B. McFerran and James Callaghan, owners of this road, have sold it to Mr. Jacob Krieger, as trustee for the Louisville, Cincinnati & Lexington Company. The price paid is understood to have been \$30,000. The purchase gives the new owners some additional facilities in Louisville, and the control of a line which might have been used as part of a new road from Louisville to Cincinnati. It is said that the road will be extended to Westport or Milton, to secure the local traffic. The road is of 3 feet gauge, and now extends from Louisville to Prospect, 11 miles.

**Marietta & Cincinnati.**—Argument was heard last week by the Court of Common Pleas at Chillicothe, O., on three motions filed by the counsel for John D. Madeira, trustee under the second mortgage, the first petitioning the Court to order the receiver to put in repair and operate the old line of road from Warren's Station to Scott's Landing; the second relating to the leases of the Baltimore Short Line and the Baltimore & Cincinnati railroads, the bondholders claiming that the rentals paid are too large; the third motion asks the Court to order the receiver to render more definite and explicit reports.

**Massachusetts Central.**—This company has finally decided upon the location of its road from Coldbrook, Mass., to Deerfield, and from Amherst to Northampton. By the line as adopted the distance from the Lowell depot in Boston to the connection with the Troy & Greenfield road in Deerfield will be 112 miles. The grading between Cambridge and West Boylston is now well advanced; between West Boylston and Coldbrook the road is ready for the rails except a rock cut in Rutland.

**Mexican Railroads.**—A recent letter to the Galveston *News* gives the following list of the railroads in that country:

NAME OF RAILROAD.	Miles constructed.	Miles to be constructed.
Celaya to Leon and Guajajuato.....	29	51
Mexico to Toluca and Cuautlan.....	27	30
Cuautlan to Tula.....	12	30
Ometusco to Pachuca and Tulancingo.....	8	51
Merido to Peto, extending toward Ticul and Texas.....	3	78
Zacatecas to San Luis, Aguas Calientes and Lagos.....	5	280
Mexico to the mouth of the Amacuzac River.....	20	280
San Luis Potosi to Tautoyuquita.....	3	131
San Martin Tescmelucan to Puebla and branch of same to Huejotzingo and Cholula.....	11	20
Merida to Progreso.....	20	3
Puebla to Matamoros Izucar.....	3	38
Vera Cruz to Alvarado.....	3	82
Vera Cruz to Medellin.....	14	...
Vera Cruz to Mexico.....	263	...
Branch to Puebla.....	20	...
Branch to Jalapa.....	91	...
District railroads.....	115	...
Total.....	665	1,094

A large number of the shorter lines we believe to be horse railroads. There are 6,164 miles of telegraph in the country, on which in 1879, only about 135,000 messages were sent, 41,216 of which were sent free. The revenue was \$57,191; the expenses, \$127,531. If the official dispatches had been paid for, the receipts would have been three times as great.

**Mississippi & Sunflower.**—This company was recently organized at a meeting held in Concordia, Miss., when an immediate survey of the line was ordered.

**Missouri, Kansas & Texas.**—The St. Louis *Republican* of May 24 says: "At the stockholders' meeting of the Missouri, Kansas & Texas Railroad, held at Parsons, Tex., on Wednesday last (two-thirds of the stockholders being present and voting), they passed a resolution recommending that the Missouri, Kansas & Texas road be leased to the Missouri Pacific Railway Company for 99 years. To this end they further empowered the directors of the company to make such lease, the Missouri Pacific agreeing to pay interest on the first mortgage bonds, the surplus above that of the earnings to be turned over to the stockholders of the Missouri, Kansas & Texas, to be disposed of under their direction. It is also ascertained from a good source that the stockholders of the Missouri Pacific road some time ago authorized the directors of the road to make such lease as implied in the above resolution."

A Gould board has been in office since last January, but does not control the road yet, the Union Trust Company still holding possession under the bondholders' agreement.

**New York, Boston & Albany.**—This company has filed articles of incorporation to build a railroad from New York to a point on the Connecticut line in North Salem, about 40 miles, and from the Massachusetts line in the town of Canaan to New Lebanon, 12 miles, where it will connect with the Harlem Extension, South. From North Salem to



Canaan, about 70 miles, the line is apparently to run through Connecticut and Massachusetts, or else to run over the Housatonic Railroad.

**New York Central & Hudson River.**—An article in the *London Railway News* of May 15, describing at some length the history, property and financial condition of this Company, is introduced as follows: "This railway is in many respects one of the most successful enterprises in the world, and its present state of prosperity is due mainly to the far-sighted policy, the indomitable perseverance, and the sustained energy of one whose name will ever be honorably associated with the progress and prosperity of his country—the late Mr. —or, as he was popularly known—Commodore Vanderbilt. The story of the early struggles of the road, its gradual and steady development, has frequently been told, and when Americans traveling abroad are scandalized by the tales of frauds and repudiations which have caused so much loss and ruin to the foreign investor, they can point to one at least of the great undertakings of the country at which the finger of scorn cannot be raised—the New York Central. Amid a mass of venal corruption such as no country in the world has produced in connection with railway enterprise, this company stands in an almost solitary position, with a credit unimpaired and a reputation unassailed and unassailable. The present financial position of the undertaking affords evidence of the value to which railway properties in the United States might attain if only conducted with a reasonable regard to the wants of the community and the interests of the proprietors. As in the case of the Baltimore & Ohio, the management of the New York Central has for years past been guided by one direct master mind, and its business has been conducted to the one great end, that of securing and maintaining a profitably remunerative return for the work done. To those accustomed to judge of American railways by the acts and policy of such dishonest and repudiating concerns as those of which the Erie is a prominent representative, the position of the New York Central must appear strange indeed. An American railway company which never fails to pay a dividend, which never repudiates an engagement, must to such persons present something of a phenomenal appearance, and should create a desire to learn something more of its present financial condition."

**New York, Ontario & Western.**—This company has filed the necessary certificates with the State Engineer of New York for an increase of the capital stock from \$50,000,000 to \$65,000,000, the increase being necessary to carry out the agreement of reconstruction. The additional stock is for issue to such holders of the old stock and convertible bonds as may desire to pay the assessment of \$30 per share and take stock in the new company.

**New York Railroad Legislation.**—The *New York Times*, which warmly advocated all the bills reported by the Hepburn Committee, speaks as follows of the treatment which these bills received in the Legislature during the session that closed last week:

"While the Legislature has not accomplished the most important work in the way of protecting the people against the greed and tyranny of the railroad corporations, that it was expected to do, it has still done something, and a brief allusion to the results of the work of the special committee and the Legislature, will be timely and proper. The committee prepared and submitted seven bills. The first was in relation to the increase of capital stock, and provided how companies may increase their stock. It prescribes that this shall not be done without the consent of two-thirds of the shareholders, and the written approval of the State Engineer and Surveyor; provision is also made for the publication of notice of intention to increase capital stock. This bill is a law.

"The second bill provides that when companies are consolidated, the amount of capital stock of the consolidated companies shall not be greater than the aggregate amount of the capital of the consolidated companies before consolidation. This bill is a law.

"The third bill is known as the 'proxy bill.' It was designed to prevent the practice of permitting brokers to vote upon shares which they do not own, and provides that no person shall vote on stock, unless it is vested in him or under his actual control. This bill passed both houses, and is in the hands of the Governor.

"The fourth bill provides for a more comprehensive detailed annual statement of the condition of railroads to the State Engineer and Surveyor. It is before the Governor for his action.

"The fifth bill was the anti-discrimination bill. As amended, Mr. Duguid says it was worthless, the destruction of the third section making the second section comparatively of no value. It was emasculated in the Senate, and died in the conference committee.

"The sixth bill was that providing for a railroad commission. It was considered in committee of the whole in the Assembly, and has not been considered since a motion to order it to a third reading was defeated.

"The seventh bill was supplementary, and was drawn to prevent the making of bogus leases, such as that consummated by the Manhattan Elevated Railroad Company. It passed the Assembly, and was smothered in the railroad committee of the Senate.

"Should the Governor approve the bills in his hands, the special committee will rejoice that it has seen four out of the six original bills made effective, while it will regret that the two for which there was most urgent need and the loudest demand have been killed by delay in committee of the Senate."

**New York, Woodhaven & Rockaway.**—This road will soon be completed and ready for business. It starts at a new hotel on Rockaway Beach, which is one of the largest summer hotels in the country, and is owned by the same parties as the railroad. From the hotel it runs along the beach 1½ miles, thence across Jamaica Bay 4½ miles, thence to Woodhaven 3 miles, and thence to a point on the Long Island Railroad, near Fresh Pond, 3 miles; with a branch, from the point on the beach where the crossing of the bay commences, to Far Rockaway, 3½ miles, making in all 15½ miles of railroad. A contract with the Long Island Railroad Company secures to the company, for the term of 50 years, the right to run in from near Fresh Pond to Hunter's Point, 4½ miles, over the Long Island Railroad, an additional track being provided for the purpose; also the connections to Flatbush avenue and Bushwick, and the control of all the travel by rail to Rockaway Beach. The road is of full standard gauge, double track, and laid, for the most part, with steel rails of 56 pounds to the yard. The company are providing equipment sufficient for the comfortable and safe conveyance of upwards of 40,000 passengers each way daily. During the busy season trains will be run at short intervals throughout the day and evening, at a charge of not over 50 cents for the round trip. It will be the shortest line to Rockaway Beach, running across Jamaica Bay on piles, while the existing lines make a long detour to avoid the bay. The company has sold \$1,000,000 of bonds.

**Northern Pacific.**—Track on the Missouri Division is now laid to Knife River, 75 miles westward from Mandan, Dak., and 16 miles beyond the point which the track had reached

last year. Regular trains are run as far out from Mandan as the coal banks. The work of track-laying is progressing steadily.

The Bismarck (Dak.) *Tribune* of May 22 says: "On the 14th inst. the Northern Pacific engineers, under Major Dodge, Locating Engineer, had located the line of the road to within nine miles of Cabin Creek, 12 miles west of the mouth of Glendive Creek. At this point the road will strike the Yellowstone. In the meantime the preliminary survey under Mr. Van Fleet has been pushed rapidly forward from Fort Keogh, who is endeavoring to locate the line on the south side of the Yellowstone to Baker's battle-ground, or Huntley, which is 35 miles above Fort Custer. Here will probably be the first crossing of the Yellowstone. The line, as it is now located, runs through the southeast corner of Miles City, and crosses the Tongue River at what is known as the upper ford."

A dispatch from Washington, May 27, says: "The House Committee on Pacific Railroads, with two dissenting votes, decided to recommend the passage of the Newberry bill granting an extension of six years to the Northern Pacific Railroad. The bill grants an extension of six years to the railroad from the 4th of July, 1880, and allows actual settlers to purchase a half-section of land from the company instead of a quarter-section, as originally provided. The second section of the bill, as originally amended, authorizes the Secretary of the Interior, at his discretion, to examine under oath the officers and agents of the company, and such other persons as he may deem expedient, touching and concerning their lands, construction and equipment, so as to audit and determine, for the purpose of this account, the amount to be properly and justly allowed as such. The third section, as amended, reads that when the total amount of sales of said lands to be paid the company shall amount to the cost of construction and equipment of said roads and portions of said railroad and a telegraph line heretofore referred to, such lands not used or occupied by said railroad company shall revert to the United States, and all amounts in excess of such actual cost shall be covered into the United States treasury. Section 4 was stricken out and the following adopted as a substitute:

"That in order to avail themselves of the rights and privileges of this act, the said company shall within six months from its passage file with the Secretary of the Interior, to his satisfaction and approval, under its corporate seal, its acceptance of the terms and provisions hereof."

**Ohio & Mississippi.**—Receiver King's statement for April is as follows:

Cash balance, April 1	\$355,822
Receipts	513,696
Total	\$869,518
Disbursements	845,943
Balance, May 1	\$23,575

In the disbursements appears the item "second-mortgage interest due Oct. 1, 1879, and April 1, 1880, and income and funded debt bonds, April 1, 1880, \$265,000."

**Peoria & Northwestern.**—This company has filed articles of incorporation in Illinois to build a railroad from Peoria to Savannah, in Carroll County, or some other point near by on the Mississippi River, connecting with the Western Union Railroad, making a line to Northwestern Iowa. The principal office of the company is located at Kewanee.

**Philadelphia & Reading.**—Almost the first act of the receivers was an application to the Court for authority to borrow \$1,000,000 to pay wages of employees and interest, falling due July 1. The application was accompanied by a brief statement and the promise of a full statement of the condition of both companies as soon as it could be completed. The Court made an order granting the Receivers authority to make the loan.

The Receivers are cutting down expenses by reducing the working force in the repair shops and putting the shops on short time. This is continued as long as the partial stoppage of coal production lasts. London dispatches say that a committee is to be formed there for the purpose of protecting the interests of the English holders of stock and bonds. The chairmanship has been offered to Lord Cairns, formerly Lord Chancellor, and a large holder of the securities, and it is understood that he will accept.

**Philadelphia, Marlton & Medford.**—A contract has been let to James J. Ryan, of West Philadelphia, for the construction of this road. It is to run from the Camden & Atlantic at Haddonfield, N. J., eastward by Marlton to Medford, a distance of 12 miles. It will be a branch of the Camden & Atlantic.

**Portland & Ogdensburg, Vermont Division.**—The St. Albans (Vt.) *Messenger*, of May 28, says: "This road is soon to have a connection with the terminal point of the Ogdensburg & Lake Champlain Railroad on the other side of the lake, at Rouses Point, by the aid of the Ogdensburg & Lake Champlain, Passumpsic, Boston, Concord & Montreal, and Portland & Ogdensburg railroad corporations. Last Saturday a party of railway officials interested in the proposed new road, visited Swanton and Rouses Point on a tour of inspection. After going over the route a consultation was held between the parties interested, and it was decided to put on a locating survey party at once, and to push the road to an early completion. The route from Maquam docks will lie along the shore of the bay, and will then diverge in nearly a straight line across Hog Island, crossing Missisquoi Bay by a pile bridge; thence over the Aburgh peninsula to Windmill Point, there connecting with the Ogdensburg Railroad portion of the bridge on the Rouses Point side. This will necessitate the construction of a bridge across the channel, nearly one-half mile in length. The length of the road will be 11 miles. The Receivers and Managers of the road have made extensive improvements on the road-bed, and contemplate building additional docks at Maquam the present season."

**Rochester & State Line.**—In the New York Supreme Court at Albany, June 2, the motion of the Attorney-General for a receiver of this road was granted. The Court held that the previous appointment at suit of the Union Trust Company was made through collusion.

**Russellville & Dardanelle.**—This company has been organized to build a railroad from Dardanelle, Ark., northward to Russellville on the Little Rock & Ft. Smith road, about 10 miles.

**St. Joseph Valley.**—This company is preparing to let contracts for a section of 10 miles of its road, from Buchanan, Mich., to Berrien Springs. The road is to be extended to St. Joseph or Benton Harbor, the location depending upon the amount of subscriptions offered.

**St. Louis, Iron Mountain & Southern.**—Complaints are made by the holders of the second income bonds that when the assents of the bondholders were required by management to permit the termination of the stock trust (by which a large proportion of the stock was held in trust for voting purposes by trustees, approved by the bondholders), and the restoration of the road to the full control of the stockholders, it was promised that if this were done interest payments

would be resumed on both classes of the income bonds; but after the assents were received and the trust dissolved interest was paid on the first incomes only. The *Public* which has paid considerable attention to the affairs of this country, and has been especially friendly to the management, says:

"Being requested to assist in obtaining assents of bondholders to the petition for termination of the trust, we called personally upon the officers of the company for information as to their course. Mr. Thomas Allen, the President, and Mr. Henry G. Marquand, the Vice-President, personally and repeatedly assured us that the interest on both classes of bonds would be paid in full, directly after the restoration of the road to the stockholders, if by the required assents that should be accomplished. The fact was admitted that, if all the extraordinary expenditures should be met from the earnings of last year before paying interest on the debt, there would not be quite money enough to meet interest on both classes of the bonds, but it was argued that the cost of a portion of the renewals and permanent improvements could properly be carried over into another year by the stockholders, after a release from the trust, and that the interest could thus be paid in full from the actual excess of earnings over legitimate and ordinary expenses. Mr. Marquand stated that certain directors of the company would willingly provide what funds might be necessary, beyond the cash on hand in the treasury, and it was also positively stated that no opposition could prevail, because Messrs. Allen and Marquand had sufficiently increased their holdings of stock to render it certain that new directors in harmony with their views would be chosen. Fortified with assurances such as these, we advised the holders of income bonds to give their assents, and similar assurances were also personally given by the officers of the company to bondholders."

"It is well known that the company has paid interest on the first income bonds only, but has taken no steps to pay on the second. The possibility of a short delay was first suggested by Mr. Marquand, after the necessary assents had been secured, in a conversation in which he said that payment on the second incomes might be deferred for a few weeks, giving the impression that it might be found more convenient to make the payments on the two classes at separate dates. In a recent interview, however, being called upon for reasons why the assurances given to the bondholders were not fulfilled, he made an explanation which, in justice to officers of the company, ought to appear with the facts above stated."

"Mr. Marquand said that it was fully expected to pay interest on both classes of income bonds, and that assurances of co-operation in that course had been obtained from a sufficient number of the directors. But when the time came to act, the company was threatened with an injunction if it should offer to pay interest on the second incomes before it had been fully earned in excess of all expenditures. It must be presumed that legal advice had been previously taken, as to the right of the company to pursue the course proposed, and yet this threat of an injunction, Mr. Marquand states, caused some of those who had agreed to that policy to change their views and to oppose it. In consequence, the proposal was defeated, but it was determined to pay interest on the second incomes also at a future time, when the surplus earnings on hand will be such as to leave no room for dispute about the lawfulness of that course. At what date this payment will be made Mr. Marquand does not think it proper now to state."

**St. Paul, Minneapolis & Manitoba.**—The St. Paul *Pioneer-Press* says: "The dirt is flying on every part of the line between Morris and Brown's Valley, and men are strung out all along it. It is 48 miles long, and will be ready for traffic by harvest time. The iron and ties are all ready to go down as soon as the grade is ready. The graders have started west from Breckinridge and will work on the west side of the river in a northerly direction. The line will cross the Northern Pacific in the neighborhood of Casselton. A force is also busy on the extension from Grand Forks west, and 12 miles of the road is all ready for the iron."

A party of engineers have started out from Minneapolis to locate a line as far as Osseo, along the west side of the river. The graders will be at work inside of ten days on the north shore of Lake Minnetonka, and this extension will be completed by the middle of July. The company will not build the new hotel at the lake this year. As has already been stated, the company will build new shops in St. Paul, but it has not yet been decided where they will be located. The work of grading the grounds for the new mammoth stockyards is going on, and estimates for the fencing, sheds etc., are being prepared. The yards will be in working order this year, but the contracts have not as yet been let. The land department of the road is as busy as it has been at any time this season, and several large sales are on the tapis. Emigration is still rushing forward over the line. New rolling-stock for the road is arriving every day, and the freight traffic keeps up remarkably well."

**Sioux City & Dakota.**—The suit of John I. Blair and others to set aside the lease of this road to the Chicago, Milwaukee & St. Paul Company, came up before the District Court at Yankton, Dak., on a motion for the appointment of a receiver, and a demurrer interposed by the company. After hearing some arguments the case was put over to the November term of the Court. In the meantime the St. Paul Company will continue to work the road.

**Spartanburg & Asheville.**—Mr. R. Y. McAden, of Charlotte, N. C., has offered to advance the money needed to complete this road from Hendersonville, N. C., to Asheville, provided the creditors and stockholders will unite in giving him a first lien on the road for the amount so advanced. A meeting was to be held last week, and it was thought that the offer would be accepted.

**Wabash, St. Louis & Pacific.**—The *Chicago Tribune* of May 26 says: "Mr. J. C. Gault, General Manager of the Wabash, St. Louis & Pacific Railroad, stated to a *Tribune* reporter yesterday that his company has as yet taken no steps to open its Chicago extension for business, and does not mean to do anything in that matter until the Supreme Court has taken action in regard to the Western Indiana complications, which he thinks will come up for a hearing in the early part of June. Should the decision of the Supreme Court be adverse to the Western Indiana, his road will be compelled to find some other way into the city for the time being. In any event Mr. Gault expects to be able to commence business over the Chicago extension of his road about July 1."

"Both the Wabash and the Grand Trunk feel very bitter against Mr. Vanderbilt for preventing the Western Indiana from crossing the tracks of the Lake Shore at Sixteenth street, and thus prevent their roads from getting adequate facilities at this point. They say that but for Vanderbilt's action the Western Indiana would have gotten to Twelfth street any way, and this would have answered all their purposes for the present. This matter may yet result in a serious fight between the Wabash and the Grand Trunk and the roads controlled by Vanderbilt."

The Lake Shore, however, is only partly opposing the entrance of the road. The bitterest opposition shown so far has been by a Catholic priest, who, we believe, acted in the



interest of numerous parishioners who thought the value of their houses and lots would be injured by the road, and all opposing interests took advantage of a flaw in the ordinance permitting the road to enter the city to stop it. The stoppage will doubtless be temporary, but in all such cases opposing interests will keep the road out of the city as long as they can.

**Washington & Ohio.**—Certain parties are reported to have made an offer to take this road and settle with the creditors, provided they will withdraw all suits and accept about one-half the face of their claims in new bonds.

**West Chester & Philadelphia.**—This road was transferred to the possession of the Philadelphia, Wilmington & Baltimore Company June 1, that company having bought a controlling interest in the stock, as heretofore noted. There will be no change in the working of the road, and the separate organization will be maintained.

#### ANNUAL REPORTS.

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#### Morris & Essex.

This company owns a line from Hoboken, N. J., to Phillipsburg, 83.68 miles, with a branch or loop line from Bergen Tunnel to Denerville, 34.54 miles; it leases the Newark & Bloomfield road, from Roseville to Montclair, 4.25 miles, and the Chester road, from Chester Junction to Chester, 10 miles, making 118.22 miles owned and 132.47 leased. The whole property is leased to the Delaware, Lackawanna & Western Company, the rental being interest on the debt and 7 per cent. on the stock. The following statements are from the report to the State Comptroller of New Jersey, for the year ending Dec. 31, 1879.

The stock and debt were as follows at the close of the last two years:

1879.	1878.	Inc. or Dec.
Stock paid in.....\$15,000,000.00	\$15,000,000.00	
Bonded debt.....20,123,000.00	19,923,000.00	I. \$200,000.00
Total.....\$35,123,000.00	\$34,923,000.00	I. \$200,000.00

Less balance, sundry assets.....687,722.02

Cost of road and equipment.....\$34,435,277.98

The stock is \$126,882; bonded debt, \$170,216, and the cost of road, \$291,281 per mile owned. This capital account makes it one of the most costly roads in the country, but a large part of it represents a very valuable terminal property at Hoboken, an expensive tunnel through Bergen Hill, and similar works. Nearly all the road is double track.

The earnings for the year were as follows:

1879.	1878.	Inc. or Dec.	P. c.
Passage.....\$849,563.35	\$800,402.63	I.	6.1
Freight.....2,443,642.82	1,715,584.95	I.	42.4
Other sources.....221,892.93	194,129.13	I.	14.3
Total.....\$3,515,099.10	\$2,710,116.71	I.	29.7
Expenses.....1,955,743.26	1,927,788.99	I.	1.5
Net earnings.....\$1,559,355.84	\$782,327.72	I.	99.3
Gross earnings per mile.....26,535.01	20,458.35	I.	29.7
Net earnings per mile.....11,771.40	5,905.70	I.	99.3
Per cent. of expenses.....55.64	71.13	D.	21.8

The increase in earnings is due to the very large coal traffic of 1879, and the light business of 1878. Expenses increased but slightly. A heavy coal traffic on this road always reduces the proportion of expenses. The coal traffic is carried in long trains at low speed and is handled at very low cost, while the large passenger traffic is chiefly suburban, and is carried at comparatively low rates and with an expensive train service. The increase in total expenses last year was, however, smaller than might have been expected.

The result to the lessee for the year was as follows:

Net earnings.....\$1,559,355.84	
Dividends and interest paid.....2,460,057.06	
Loss for the year.....\$900,701.22	

The net earnings, after deducting interest on bonds, were a little over 1 per cent. on the stock. The net earnings last year were the largest the road has ever made.

#### Delaware & Bound Brook.

This company's road extends from the Delaware River northeast to Bound Brook, N. J., 27 miles, all double track, with a branch to Trenton, 3.7 miles, making 30.7 miles in all. It forms about one-third of the "New Line" between New York and Philadelphia, the other sections being made up by the Central of New Jersey, from Bound Brook to Jersey City, and the North Pennsylvania from the Delaware

Crossing to Philadelphia. In May last the road was leased to the Philadelphia & Reading Company at a rental consisting of interest on the debt and dividends on the stock of 6 per cent. for two years; 7 per cent. for two years more, and 8 per cent. thereafter. The following statements are from the report made to the Comptroller of New Jersey for the year ending Dec. 31, 1879:

The stock and debt were as follows at the close of the last two fiscal years:

1879.	1878.	Inc.
Stock paid in.....\$1,584,400.00	\$1,514,000.00	\$70,400.00
Bonds.....1,500,000.00	1,500,000.00	
Floating debt.....206,000.00	279,620.06	19,979.34
Total.....\$3,384,000.00	\$3,293,620.06	\$90,379.34

Cost of road and equipment.....3,138,056.64

The stock is \$51,609, and bonds \$48,860 per mile of road. Cost of road is \$102,217 per mile. The yearly rental is thus \$215,979, until May 1, 1881; \$230,979 thence until May, 1883, and \$245,972 thereafter.

The earnings for the year were as follows:

1879.	1878.	Inc. or Dec.	P. c.
Passage.....\$141,950.99	\$137,290.97	I.	3.4
Freight.....165,791.35	132,133.16	I.	25.5
Other sources.....2,717.97	1,145.88	I.	137.2
Total.....\$310,460.31	\$270,570.01	I.	14.7

Expenses.....167,213.83

Net earnings.....\$143,256.48

Gross earnings per mile.....10,113.01

Net earnings per mile.....4,666.30

Per cent. of exp's.....53.85

The net earnings were sufficient to pay interest on the debt and 1.1 per cent. on the stock. The lessee paid quarterly dividends of 1½ per cent. each, as required by the lease, in August and November. The earnings show a fair increase, especially in freight, with a small comparative reduction in expenses.

#### Vicksburg & Meridian.

This company owns a line from Vicksburg, Miss., to Meridian, 140 miles, with an extension to the levee in Vicksburg, 3 miles. Its report is for the year ending Feb. 29, 1880.

The equipment consists of 17 engines; 7 passenger, 3 sleeping and 3 baggage cars; 46 box and 58 flat cars, and 24 caboose cars. Eleven box cars were condemned and 24 new flat cars built.

The company has a land grant, from which 3,400 acres were sold during the year for \$4,200. The receipts of the Land Department, including balance from previous year, were \$5,645.22, from which \$1,485.95 were paid for redemption of bonds. There were \$4,030.93 land notes on hand at the close of the year. An increased inquiry for land is reported.

The balance sheet is as follows:

Capital stock.....\$357,407.60	
Preferred stock.....1,042,517.60	
Total stock (\$3,790 per mile).....\$1,399,925.20	
Funded debt (\$21,927 per mile).....\$3,135,522.76	
Bills payable and land scrip (\$839.14).....42,284.88	
Total.....\$4,577,732.93	

Road and equipment (\$21,761 per mile).....\$3,040,563.88

Mississippi River Extension and land.....128,642.70

Extension tonnage dues.....60,000.93

Bills receivable.....38,185.53

Profit and loss.....1,294,330.80

The floating debt was increased by \$5,617.84 during the year. There was \$2,322.50 of preferred stock scrip issued. There are \$80,200 bonds in the sinking funds.

The traffic for the year was as follows:

1879-80.	1878-79.	Inc. or Dec.	P. c.
Passenger.....104,041	80,179	I.	29.8
Freight.....114,600	64,151	I.	78.7
Service and switching.....48,418	43,582	I.	11.1
Total.....267,122	187,912	I.	42.2
Av. miles per engine.....15,713	11,052	I.	42.2
Cost of motive power per mile.....11.5 cts.	13.0 cts.	D.	1.5
Passengers carried.....63,225	43,996	I.	44.8
Passenger mileage.....2,576,690	1,837,245	I.	40.2
Bales cotton carried.....77,951	62,307	I.	25.1
Total tons freight carried.....70,036	45,597	I.	53.6
Av. passenger train load.....24.77	22.91	I.	8.1
Per pass. per mile.....5.08 cts.	5.42 cts.	D.	6.3
Per ton per mile.....2.80 "	3.20 "	D.	14.9

Of the tons carried, 59,090 were local and 10,945 through freight; 42,164 tons were carried west and 27,872 tons east. The freight traffic could have been increased, but the insufficient equipment prevented some efforts in that direction.

The earnings were as follows:

1879-80.	1878-79.	Inc. or Dec.	P. c.
Passage.....\$130,270.10	\$99,589.19	I.	30.8
Freight.....374,425.67	213,399.87	I.	30.8
Mails, etc.....19,693.45	16,216.73	I.	20.5
Total.....\$424,389.22	\$329,175.79	I.	28.9
Expenses.....295,002.35	258,800.99	I.	14.0
Net Earnings.....\$129,386.87	\$70,314.80	I.	84.0
Gross earn. per mile.....2,067.70	2,318.14	I.	28.0
Net per mile.....904.80	465.17	I.	82.8
Per cent. of exp's.....60.51	78.04	D.	11.6

From these net earnings there are sundry extraordinary expenses to be deducted. The account stands as follows:

Net earnings.....\$129,386.87	
New equipment.....\$16,898.14	
New bridge and buildings.....5,201.28	
Contingent expense, tax, etc.....26,470.62	
Total.....\$48,570.04	
Net balance (\$565.15 per mile).....\$80,816.83	

This balance was used in meeting accruing floating debt and satisfying judgments sued out against the road. No interest was paid on the bonds during the year.

The General Superintendent reports the prairie section of the road (about 50 miles) in bad condition, owing to the treacherous nature of the soil and the absence of ballast. There is urgent need of ballast and better care of road-bed, or it will become unsafe to run trains at even the present moderate rate of speed. Extensive renewals of rails are needed; there are in the track 81½ miles of 50-lb. rails which have been 21 years in service, and 25 miles of 45-lb. rails which have been in use since the road was first built, 43 years ago. These are now badly worn, and should be replaced at once.

Motive power and cars are in good condition. More cars are very much needed. Two locomotives, both about 20 years old, have been condemned, and two new ones ordered in their place.

The changes in the Mississippi River in front of the city of Vicksburg, rendered it necessary to extend the branch leading to the levee and landing about one mile to a new landing.

This work was promptly executed, and facilities for loading cotton and coal provided at the new landing.

The year showed a great improvement over the previous one, when business was almost stopped for several months by the yellow fever. An increase is looked for from the extension and completion of the Vicksburg, Shreveport & Pacific road.

#### Hanover Junction, Hanover & Gettysburg.

This company owns a line from Hanover Junction, Pa., to Gettysburg, 30 miles, and it leases and works the Berlin Branch, 7 miles; the Bachman Valley road from Valley Junction, Pa., to Ebbvale, Md., 14 miles, and the Baltimore & Hanover road, from Black Rock, Md., to Emory Grove, 20 miles, making 71 miles in all. The company owns a large interest in its leased lines. The Baltimore & Hanover road was not opened for business until Dec. 1, 1879, being worked for only four months of the fiscal year, which is that ending March 31, 1880.

The statement of liabilities and assets is as follows:

Stock (\$3,895 per mile).....\$116,850.00	
Bonds (\$6,933 per mile).....208,000.00	
Floating debt and unclaimed dividends.....10,705.65	
Profit and loss.....295,650.43	
Total.....\$631,206.08	

Road and equipment (\$15,689 per mile).....\$470,694.33

Stocks and bonds owned.....121,850.00

Fuel and materials.....6,405.00

Cash and bills receivable.....32,286.75

Total.....\$631,206.08

The stock and debt are extremely small; apparently a large part of the cost of the road and its investments in leased lines have been paid for out of surplus earnings.

The equipment of the road now consists of 8 engines; 12 passenger and 2 baggage cars; 79 freight cars, and 1 derrick car.

The traffic for the year was as follows:

1879-80.	1878-79.	Inc. or Dec.	P. c.
Passengers carried.....39,056	44,055	D.	13.6
Tons freight carried.....72,581	41,126	I.	76.5
Tonnage mileage.....685,101			
Av. rate per ton per mile.....4 cts.			

The falling off in passenger traffic was largely due to the fewer number of excursions to Gettysburg. Of the passengers carried 17,828 were through and 20,228 local. All classes of freight showed an increase, the most marked gains being in iron-ore, limestone and coal. In freight the road labored under the disadvantage of an unfriendly connection at Hanover Junction, for which it was without remedy until the completion of the Baltimore & Hanover road opened a connection with the Western Maryland road for Baltimore.

The earnings for the year were as follows:

1879-80.	1878-79.	Inc. or Dec.	P. c.
Passage.....\$19,305.33	20,083.28	D.	3.9
Freight.....2,482.42			
Mails and express.....14,531.01			
Miscellaneous.....			
Total.....\$35,320.76	\$20,166.56	I.	75.3
Expenses.....43,602.98	34,974.14	I.	24.7
Net earnings.....\$1,717.78	\$15,192.42	D.	88.4
Gross earn. per mile.....1,133.45	1,130.26	I.	0.3
Net earn. per mile.....354.78	444.49	D.	20.2
Per cent. of exp's.....66.71	60.67	I.	10.0

The miscellaneous earnings include receipts for working leased lines. The earnings show an encouraging increase, in spite of a reduction of 10 per cent. in passenger, and 12½ per cent. in freight rates. The increase in expenses is due to extra labor on road, and the fact that in the previous year nearly all the new rails used were procured by exchanging the accumulation of old rails. The net earnings, after deducting interest on bonds, were enough to pay 7.8 per cent. on the stock, but it was thought best to use them to buy new equipment.

The income account was as follows:

Net earnings.....\$1,717.78	
Bonds sold.....13,480.00	
Cash on hand, March 31, 1879.....2,010.92	
Total.....\$17,208.70	
Interest paid.....\$12,630.00	
Floating debt paid off.....6,000.00	
New equipment.....5,477.32	
Total.....\$24,107.32	

Balance, March 31, 1880.....\$13,142.66

During the year 40 tons of steel, 12 tons of iron rails and 6,790 new ties were laid. There were 6 passenger and 28 freight cars added. Road and equipment were kept in good condition. The Loughridge brake was put on the passenger trains.

The Baltimore & Hanover road has done a good business since its opening, besides giving the road an excellent connection to Baltimore over the Western Maryland road.

Legislative authority has been secured to consolidate the leased lines with the company, and it can be done on a fair basis, should it seem advisable after full consideration.

#### Pacific Mail Steamship Co.

This company operates steamship lines between New York and San Francisco by way of the Isthmus of Panama, and from San Francisco to Yokohama, Hong Kong, Australia and British Columbia.

The report for the year ending April 30, 1880, submitted at the annual meeting, gives the following figures:

Earnings from steamers.....\$3,586,443	
Subsidies, etc.....383,439	
Total.....\$3,969,882	
Expenses.....3,510,821	
Net earnings.....\$459,061	

Paid during the year, not included in above expenses, \$94,094.44, account of taxes 1874, and interest charged profit and loss. Due from overland railroads about \$100,000, not included in above earnings, payable as soon as accounts are audited, making net earnings for the year about \$550,000; decrease in profit and loss account during the year, \$379,406.72; decrease of liabilities for the year, \$505,170.64.

The earnings for the year by the different lines from passengers and freight were:

Atlantic line.....\$600,915.06	
Panama line.....1,531,677.28	
Victoria line.....201,978.07	
Trans-Pacific line.....630,057.79	
Australian line.....321,213.88	
Total.....\$3,586,442.58	

The Victoria (British Columbia) and Australian lines were run at a small loss. The New York-San Francisco business is done under an agreement with the Pacific railroad companies under which this company receives a large subsidy on condition of maintaining rates. The company is now (since the last election) fully controlled by the Union and Central Pacific companies, or their chief owners.